The Only Journal With a Paid Circulation in the Rock Products Industry

Rock Products

Vol. XXIV, No. 3 CHICAGO January 29, 1921

EDITORIAL DEPARTMENT—
Nathan C. Rockwood, Editor
Chas. A. Breskin, Assistant Editor

BUSINESS DEPARTMENT—
Geo. P. Miller, Manager.

EASTERN OFFICE—
Chas. H. Fuller, Manager, 101 West 41st Street, New York City, N. Y.

CIRCULATION DEPARTMENT—
H. J. Wolfe, Manager. Circulation 5300 copies net. Applicant for membership Audit Bureau of Circulation.

SUBSCRIPTION—Two dollars a year to U. S. and Possessions. Three dollars a year to Canada and foreign countries. Twenty-five cents for single copies.

TO SUBSCRIBERS—Date on wrappers indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

POST-OFFICE ENTRY—Entered as second-class matter, July 2, 1907, at the Chicago, Ill., Post-office, under the Act of March 3, 1879.

PUBLICATION—Published every other Saturday by

TRADEPRESS PUBLISHING CORP.
542 South Dearborn Street, Chicago, Ill.

W. D. Callender, President.
N. C. Rockwood, Vice-President.
Geo. P. Miller, Treasurer.
C. O. Nelson, Secretary.

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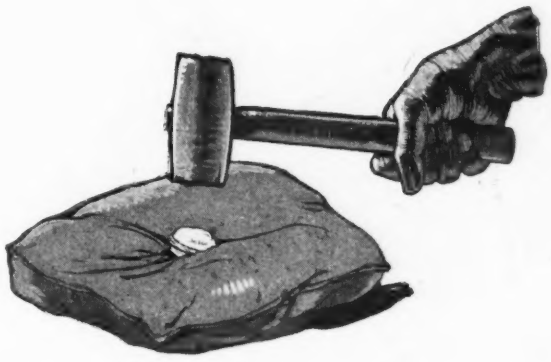


You can't crack a nut on a pillow!

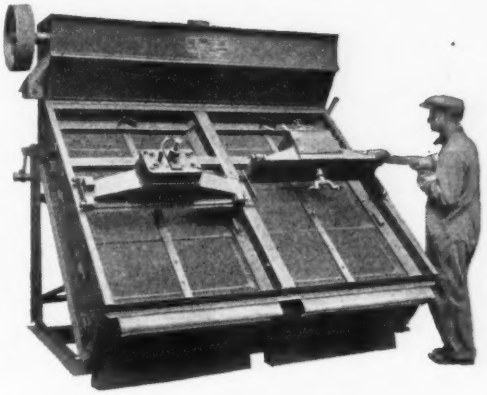
NOR can you get the largest tonnage from a crusher when it retains a large percentage of fine material which acts as a cushion.

It is a well-known fact that fines, when they are produced and retained in the crusher, interfere with the crushing action of the coarser particles because they act as a cushion to the material being crushed.

It is also a well-known fact that the coarser particles grinding against each other assist the pulverizing action.

With the HUM-MER "electrically" vibrated screen you can remove the fines from your crushers as fast as they are produced, you can feed the grinder to the limit of its capacity and the fines will be removed by the HUM-MER.

In one installation, working in closed circuit with Harding Mills on cement, by increasing the feed to the mill and screening the fines with the HUM-MER, the output of a given size material was more than doubled, and this with the same horse-power.



HUM-MER

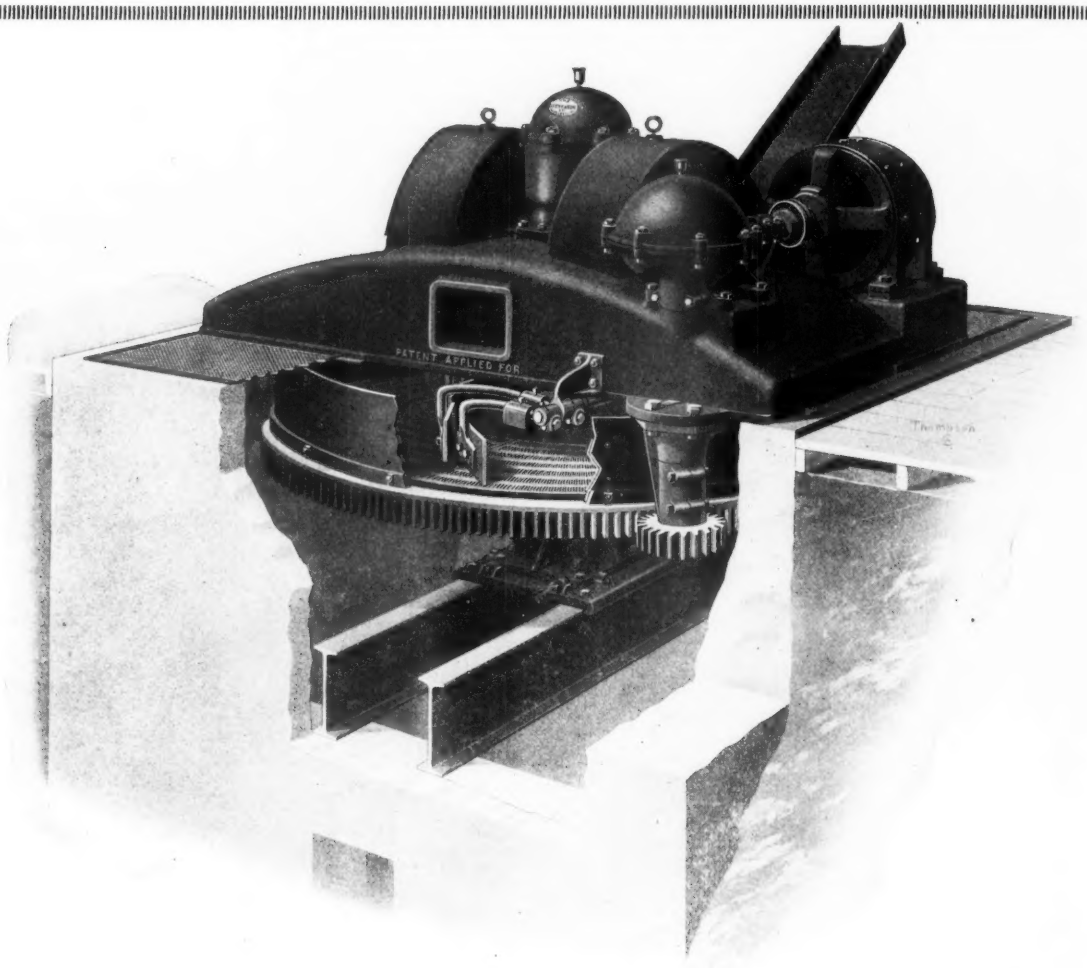
Electro Magnetic

SCREENING PROCESS

Send for catalogue No. 42-R

THE W. S. TYLER COMPANY, Cleveland, Ohio

Manufacturers of woven wire screens and screening equipment



Stevenson Grinding Pan

If you have followed the arguments in the editorial column of ROCK PRODUCTS, you will remember it is agreed among authorities that for general use farm lime should be a mixture of fine and coarse, but not above 4 mesh.

This being a recognized fact, why not use the machine that produces the material as required, and a Stevenson Grinding Pan will do it.

It is also adapted for clay or any other product.

Send for Literature

The Stevenson Company

General Offices and Works—Wellsville, Ohio

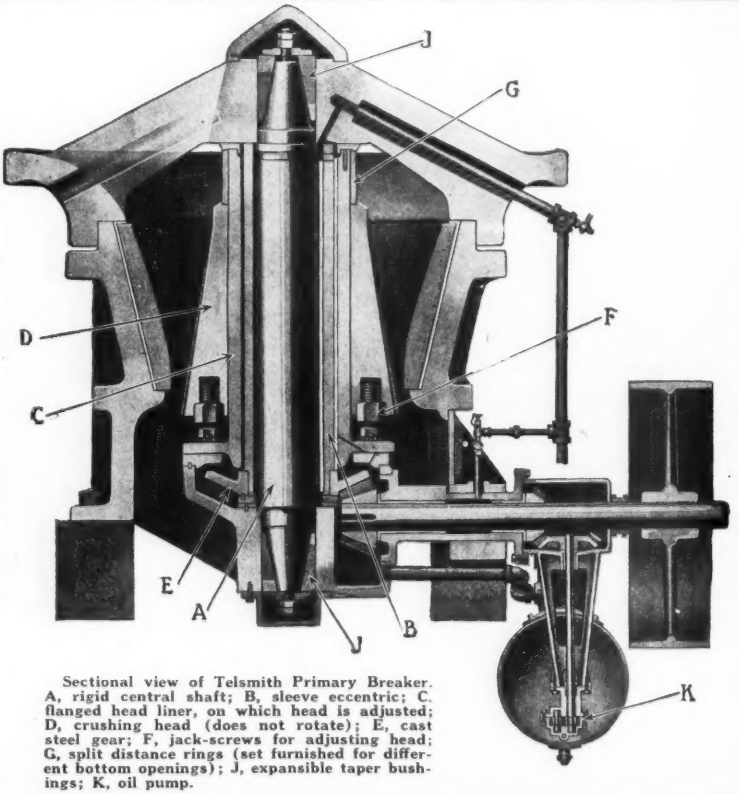
Engineering and Western Sales Offices—Monadnock Bldg., Chicago, Illinois

CRUSHER STRENGTH

Don't confuse crusher strength and crusher weight. The long frame of a lever-shaft gyratory breaker is necessarily heavy—but not always strong. In fact, it will only take two minutes of your time and a comparison of weights and heights, to demonstrate that Telsmith is heavier, per inch of height, than any other crusher on the market. More important still, the Telsmith main shaft is rigid (not gyratory or rotary). It really isn't a shaft at all, but just a big bolt to clamp the crusher structure firmly together. It adds tremendously to the strength and rigidity of the whole machine.

A word more about this shaft—*it is absolutely unbreakable.* It defies hammers, dipper teeth, drill points—even dynamite. The Telsmith short massive bolt-shaft will prove your sturdy henchman in the day when his strength is needed.

May we tell you about Telsmith's parallel stroke, big feed areas, enormous eccentric bearings and force-feed oiling system? It's all in our catalog No. 166 (Telsmith Primary Breaker) and Bulletin No. 2-F-11 (Telsmith Reduction Crusher).



Sectional view of Telsmith Primary Breaker. A, rigid central shaft; B, sleeve eccentric; C, flanged head liner, on which head is adjusted; D, crushing head (does not rotate); E, cast steel gear; F, jack-screws for adjusting head; G, split distance rings (set furnished for different bottom openings); J, expansible taper bushings; K, oil pump.

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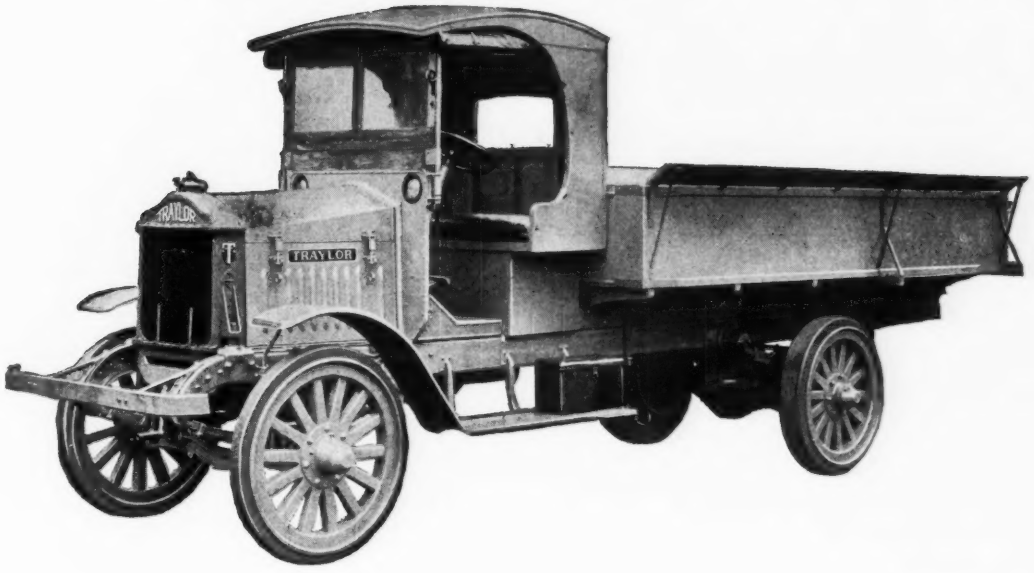
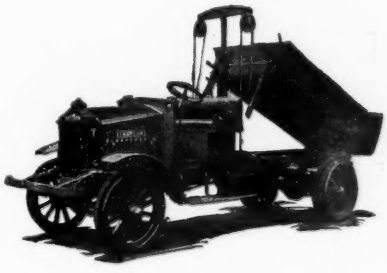


Every Traylor Truck Leaves the Plant a Complete Unit

From our years of experience in designing mining, milling, and smelter machinery, and our knowledge of the conditions under which they must operate, we know just what a truck is expected to stand and we have built them accordingly. Sufficient weight to stand the loads, ample power to get over the hills and rough roads—and a body for the particular work you wish to use it on—and we build all our own bodies and can furnish any type desired—which means prompt delivery of a complete unit.

This feature should be of as great an interest to the modern mining man as it was to our ancient, yet learned visitors.



Traylor Engineering & Manufacturing Company

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Truck and Tractor Division **Cornwells, Bucks Co., Pa.**

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For Immediate Delivery

28 in. x 36 in. Bulldog Jaw Crusher
48 in. x 60 in. Bulldog Jaw Crusher
8 in. Bulldog Gyratory Crushers
36 in. x 16 in. Type "A" Crushing Rolls
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A Traylor Motor Truck Hauling your concentrates and a Traylor All-Purpose Tractor Cultivating your ranch means real economy.

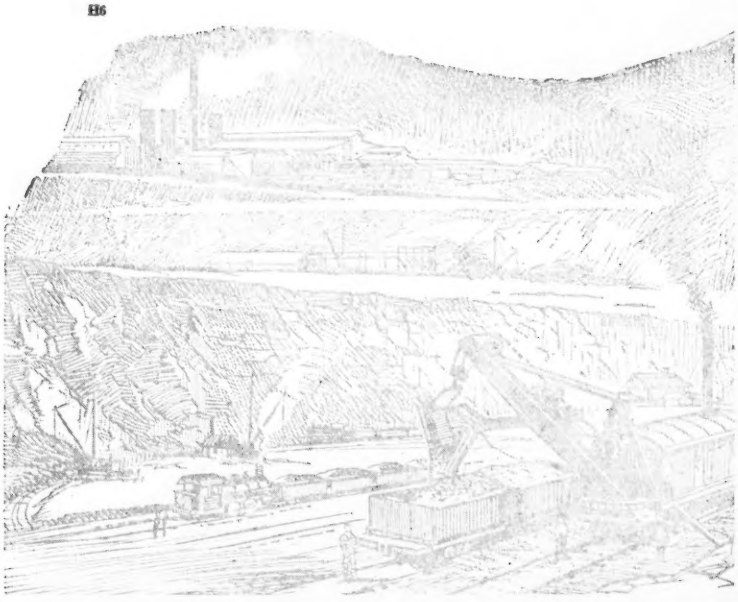
Profit by the experience of these large operators

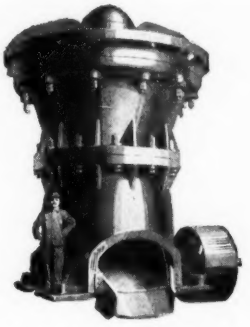
LEADING cement manufacturers after installing a trial outfit of Worthington crushing and grinding machinery were so well satisfied with the work done and the economies effected that they multiplied their original orders—erected whole plants around Worthington machinery built at the Worthington Power and Mining Works, Cudahy, Wisconsin.

Machinery ordered and in use by these concerns includes Superior McCully gyratory crushers, jaw crushers, rolls, ball and tube mills, conveying machinery and gas engines.

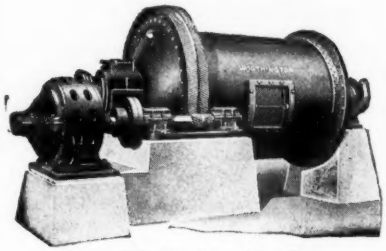
The eastern Worthington works specialize in building pumps, compressors, condensers, heavy oil engines, water wheels, and a complete line of power plant pumping apparatus.

WORTHINGTON PUMP AND MACHINERY CORPORATION
Executive Offices: 115 Broadway, New York City
Branch Offices in 24 Large Cities

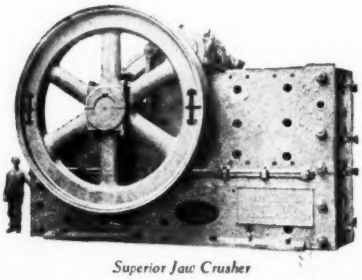




Superior McCully Gyratory Crusher



7' x 10' Tube Mill—Direct Motor Driven



Superior Jaw Crusher

PUMPS—COMPRESSORS—CONDENSERS—OIL & GAS ENGINES—METERS—MINING—ROCK CRUSHING & CEMENT MACHINERY

WORTHINGTON

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Laidlaw Works, *Cincinnati, Ohio.*
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PRECISE DESIGN, based on an experience of over thirty-six years of steam shovel building - - *discriminating choice of materials*, with facilities for selecting and testing — *expert workmanship*, with competent supervision and careful inspection—all are incorporated in the "Marion 21."

Crawling traction trucks are the preferred mounting. The 6" x 6" main engines, with extra large boiler, insure ample power and steady performance. The wide working range of the dipper permits operating in restricted places or where maximum limits are required.

Dependable "Marions" are always preferred by experienced contractors. They use them because they know that "Marion" quality and service *can be trusted.*

Let us assist in selecting the type best suited for your work.

THE **Marion** STEAM SHOVEL CO.

Established 1884 Marion, Ohio

New York Chicago Atlanta San Francisco

Boise, Idaho, - Clyde Equipment Co.	**Philadelphia,** H. L. Cox, 13 & Cherry
Billings, Mont., F. B. Connelly Co.	**Pittsburgh,** - - - J. W. Patterson
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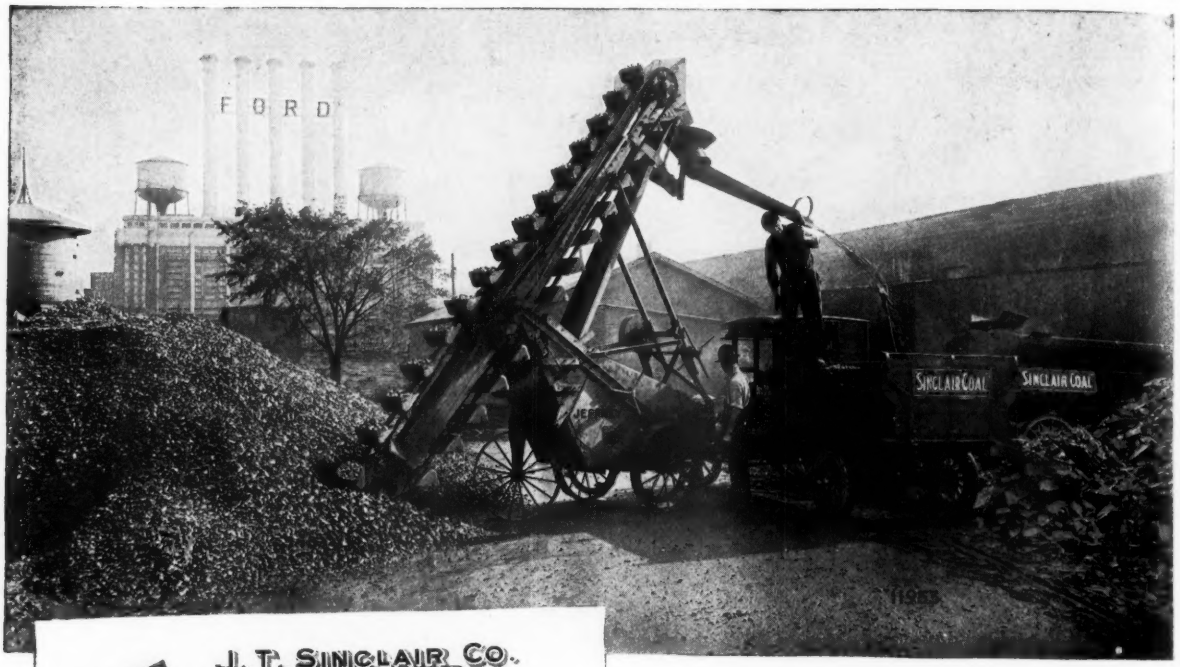
Denver, - - - H. W. Moore & Co.	**Salt Lake City,** H. W. Moore & Co
Detroit, W. H. Anderson T. & S. Co.	**Seattle,** - - Clyde Equipment Co
Vancouver, - - - - - - - - - - - Vancouver Machinery Depot, Ltd.	
Montreal, Toronto, - - - - - - - - - - - F. H. Hopkins & Co., Ltd.	

EVERYWHERE RELIABLE — THE Marion STEAM SHOVEL CO. — ESTABLISHED 1884



J. T. SINCLAIR CO.
COAL AND COKE

DETROIT, MICH.
November 9, 1920.

Mr. O. B. Westcott, District Mgr.,
Jeffrey Mfg. Co.,
Book Bldg, Detroit, Mich.

Dear Sir:-

We are pleased to report that our type K radial Jeffrey loader is fulfilling all the promises you made for it-and incidentally, that's going some.

On Oct. 11th we unloaded three hopper cars of hard coal at a cost of 5¢ per ton and being skeptical of this performance the writer, personally, witnessed the following day's unloading which convinced me that "figures don't lie."

This represents a saving of twenty five cents per ton compared with the most efficient hand labor unloadings. The Machine will handle about seventy five per cent of the retail coal distributed thru our Highland Park Yard and based upon last year's tonage will pay for itself in one season.

But the big feature - the loading of trucks and wagons will enable us to load five times as many tons with the same crew of men which means another saving of twenty five cents per ton plus the increased earnings from a greater tonage.

We are enthusiastic over this labor saver. It is the first piece of coal handling, machinery with which we are acquainted that has proven to be really portable.

Yours very truly,

J. T. SINCLAIR CO.
By A. T. Arbury
Sec'y. & General Mgr.

Here's Proof That the Jeffrey Radial Loader Will Pay for Itself in One Season

As Mr. Arbury says, "Figures don't lie" — the performances of Jeffrey Radial Loaders speak for themselves.

We have two new Catalogs fully illustrating and describing Radial Loaders.

Catalog No. 309-H features the Heavy Duty Type "G" which handles 1½ to 2 cubic yards of Sand, Gravel, Crushed Stone, Coal, etc., per minute.

Catalog No. 288-N features the Type "K" which has a capacity of 1 cubic yard per minute.

Send for both catalogs

The Jeffrey Mfg. Co. 935 North Fourth St. Columbus, Ohio

New York Boston · Scranton Buffalo · Philadelphia Cleveland · Pittsburgh Chicago · St. Louis Birmingham Charleston, W. Va. · Dallas Milwaukee · Los Angeles Denver · Montreal Detroit

Manufacturers of Pulverizing, Conveying and Elevating Machinery; Chains; Self-Propelling Loaders; Electric Trolley and Storage Battery Locomotives, etc.

First to Protect the Buyer

IN the early days of the Explosives Industry, dynamite was sold just as Dynamite. The user had no means of telling what strength powder he was using until the Du Pont Company inaugurated the standard practice of putting the exact strength of the explosive on every box and on every cartridge.

Explosives buyers were quick to recognize the value of this method of marking. As a result this practice was rapidly made a general one throughout the industry.

This is merely another instance of that spirit of service which has been the guiding principle of this organization since the first Du Pont founded the Explosives Industry in the United States in 1802.

Du Pont Service enters into every phase of the production and use of explosives. Our facilities in plant, laboratory and in the field have made it possible for us to develop this service to an unusual degree,—first in producing explosives of remarkable and uniform value; and second, in aiding our customers in all matters pertaining to their handling and use.

This Du Pont Explosives Service is yours to command in solving your own explosives problems.

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Juneau, Alaska
Kansas City, Mo.
New York, N. Y.
Pittsburgh, Pa.
Portland, Ore.
St. Louis, Mo.
San Francisco, Calif.
Scranton, Pa.
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Du Pont Products Exhibit
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E. I. DU PONT DE NEMOURS & CO., Inc.
***Sales Department:* Explosives Division**
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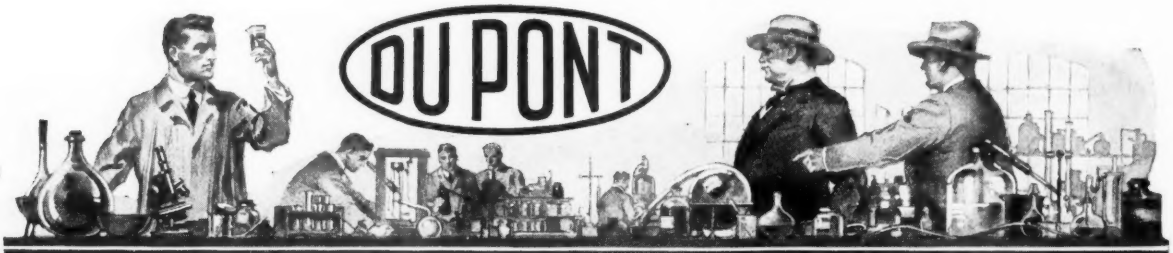
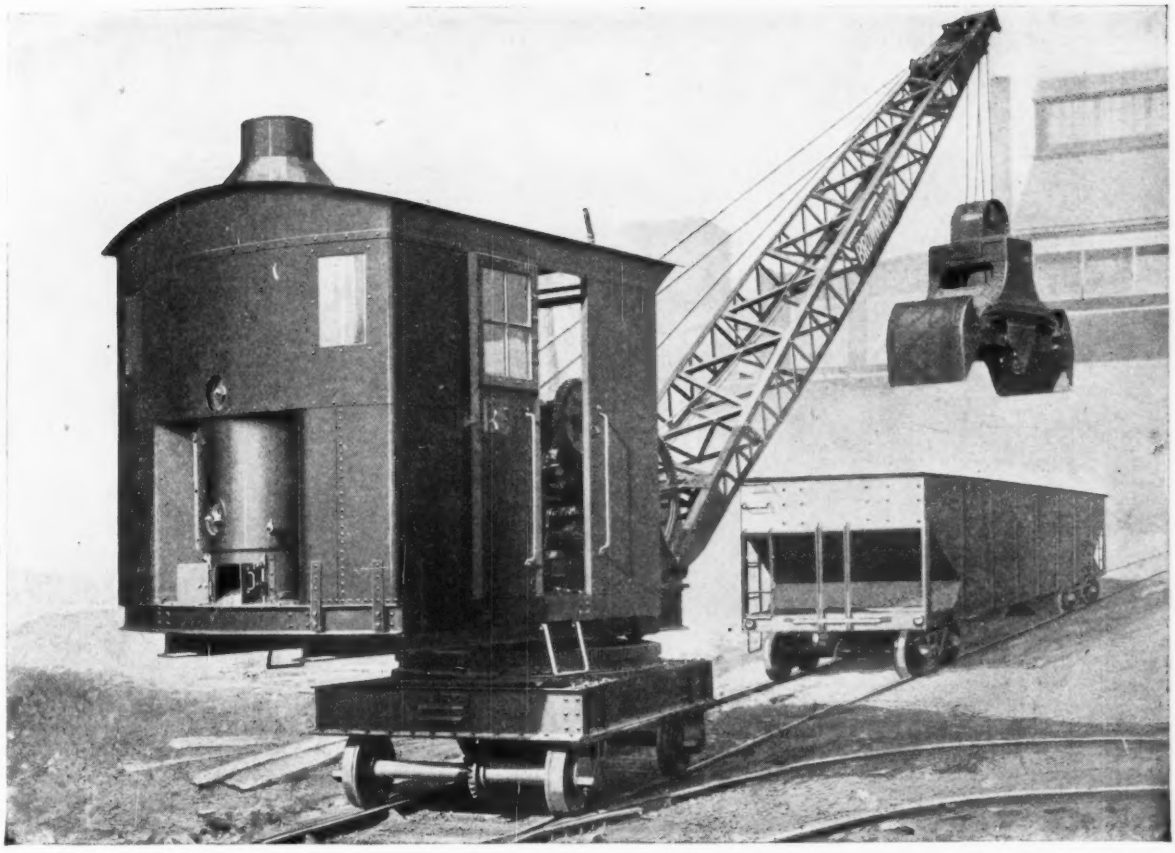


EXPLOSIVES ~ SERVICE



BROWNHOIST

No. 2 Locomotive Cranes

are built to operate by steam, electricity or gasoline engine. They are supplied with railroad or traction road wheels or Brownhoist creeper trucks. And they have unusually fast operating speeds when handling either bucket, magnet, bottom block or other attachments.

For your handling need—
A small Brownhoist

Perhaps the materials you handle are not heavy nor bulky enough to use a large locomotive crane economically. But on many jobs a crane of smaller capacity would probably save you a good deal of time and money. To provide a small versatile locomotive crane for this light handling work Brownhoist is now building a crane of smaller handling capacities.

Severe tests on all kinds of work have proved that this new No. 2 Brownhoist locomotive crane will do everything within its capacity that the larger Brownhoists are doing. And these larger types have won a reputation for hard, steady work on every kind of material handling. Many of them have been giving good service for over twenty years.

Some handling jobs similar to your own are probably shown in our new catalog K. Among these views are several of this new No. 2 Brownhoist. This book might suggest some ideas in regard to your handling. May we send you a copy?

The Brown Hoisting Machinery Company

40 Years in Crane Business **Cleveland, Ohio, U. S. A.**

Engineers and Manufacturers of Heavy Dock Machinery, Bridge Cranes, etc., as well as smaller Cranes and Hoists

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European Rep.: H. E. Hayes, 12 Rue de Phalsbourg, Paris

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CHALMERS & WILLIAMS

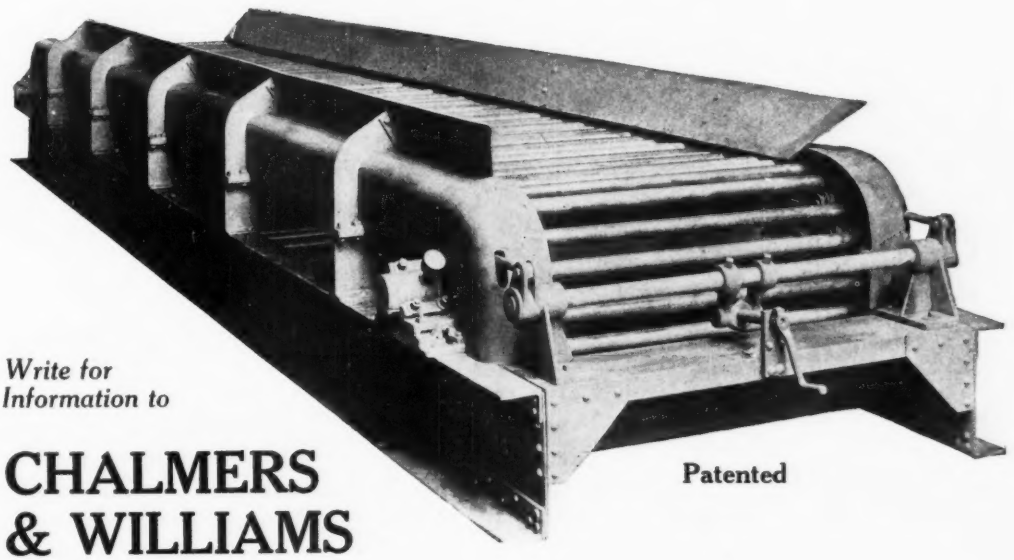
Announce

Beginning Jan. 1st, 1921, arrangements for the manufacture and sale of the

ROSS AUTOMATIC DROP BAR GRIZZLEY-FEEDER and SCREEN

For use in Mining, Smelting, Sand, Gravel, Crushed Stone, Coke, Blast Furnace and numerous other Plants.

Cannot block or choke — will handle material at an even rate for 24 hours a day without labor or attendance.



Patented

Write for Information to

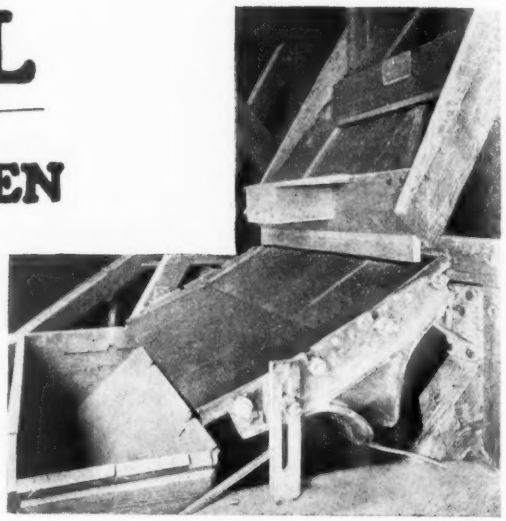
CHALMERS & WILLIAMS
1425 Arnold Street
CHICAGO HEIGHTS, ILL.

Larger Capacity—at Lower Cost

That's what the

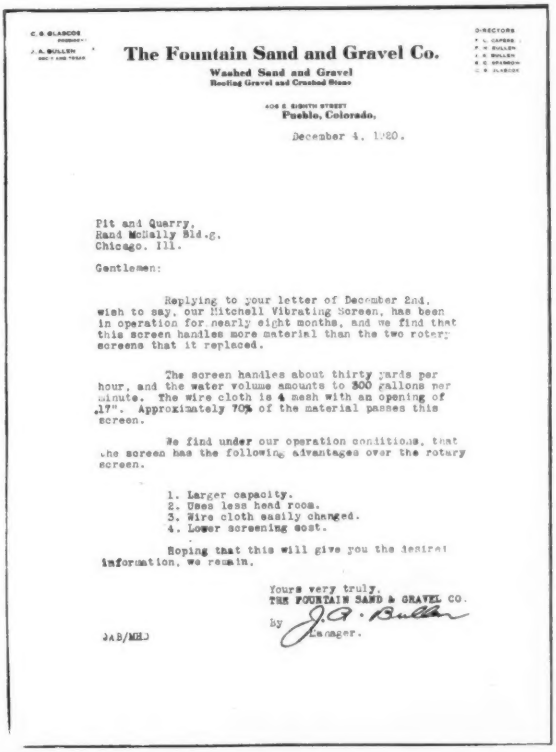
MITCHELL ELECTRIC VIBRATING SCREEN

—is doing for others. Let us tell you why it will do equally as well for you.



Mitchell Screen operated by Fountain Sand and Gravel Co.

Proof of Its Performance



The Fountain Sand and Gravel Co.
Washed Sand and Gravel
Roofing Gravel and Crushed Stone
Pueblo, Colorado,

December 4, 1920.

Pit and Quarry,
Rand McNally Bldg.
Chicago. Ill.

Gentlemen:

Replying to your letter of December 2nd, wish to say, our Mitchell Vibrating Screen, has been in operation for nearly eight months, and we find that this screen handles more material than the two rotary screens that it replaced.

The screen handles about thirty yards per hour, and the water volume amounts to 300 gallons per minute. The wire cloth is 4 mesh with an opening of .17". Approximately 70% of the material passes this screen.

We find under our operation conditions, that the screen has the following advantages over the rotary screen.

1. Larger capacity.
2. Uses less head room.
3. Wire cloth easily changed.
4. Lower screening cost.

Hoping that this will give you the desired information, we remain,

Yours very truly,
THE FOUNTAIN SAND & GRAVEL CO.
by J. A. Bullen
Manager.

JAB/MEL

Another MITCHELL Record

Here is the record of a Mitchell Screen Vibrator, summed up on the 506th day after the screen's installation:

1. It had run the full 506 days, 24 hours a day, without ever being taken from the frame—without even being stopped a moment for repairs.
2. It handled the following tonnage of ore in that time (operating in closed circuit with rolls):

Total feed to screen (includes circulating load)	1,152,606 tons
Total screen undersize (final product)	594,027 tons
Total screen oversize (circulating load)	558,579 tons

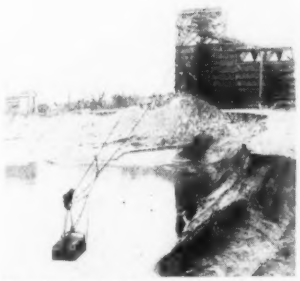
3. In all that time and with that heavy tonnage it averaged only ½ h.p. per day.
4. Total screening cost per ton, including wire cloth, power and labor, *less than one-tenth of a cent per ton!*
5. The vibrator is still running—without having had a dollar spent on it for repairs.

What the Mitchell is doing for others it will certainly do for you. Further extremely interesting information regarding Mitchell performance is available. We urge you to write immediately.

Stimpson Equipment Co.
Manufacturers and Sole Agents in United States
321 Felt Building Salt Lake City, Utah

SAUERMAN DRAGLINE CABLEWAY EXCAVATORS

are endorsed by leading gravel producers for their ability to dig and convey materials at lowest cost per ton



The pit shown above is about 60 ft. in depth and 500 ft. in diameter, the result of two seasons' operations with a Sauerman 600 ft. span, 1 cu. yd. equipment.

This gravel deposit is 100 ft. deep, about half being under water.

Part of output of this pit goes to a concrete pipe factory adjoining the gravel plant.

Above view shows pit created by Sauerman outfit in two months.

Evidence is available to warrant the statement that a Sauerman Dragline Cableway Excavator can dig and deliver to the hopper of a washing and screening plant, any definite tonnage of sand and gravel at a lower per ton cost than is possible with other equipment or combination of equipment.

The cost data forming the basis of our claim has been supplied by prominent gravel producers who have operated Sauerman Dragline Cableway Excavators for a considerable length of time. Some of these producers employ several of our equipments at different locations with consequent variations in ground conditions, and none of the cableways has been favored by especially ideal digging conditions.

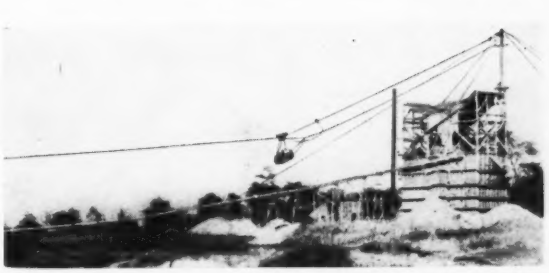
The proofs of low cost referred to have come not only from large gravel plants where 1½ cu. yd. and 2 cu. yd. Sauerman cableways are installed, but also from the local pits that are using our smallest size outfits.

It is apparent, therefore, that we have a money-saving proposition for the owner of any gravel pit, large or small. As to the ability of Sauerman cableways to meet varying situations and requirements, the illustrations on this page give some idea of the adaptability of our type of equipment and our Catalog No. 7 contains all the further proof anybody could ask for. If you haven't already received a copy of this catalog, write for it today.

Working models of Sauerman Cableways and Sauerman Power Scrapers will be exhibited at National Road Show, Chicago, February 9-12, 1921.

SAUERMAN BROS.

1140 Monadnock Block **Chicago, Ill.**



This 600 ft. span Sauerman cableway is working a pit after steam shovel operations had to be abandoned.

At this plant, the Sauerman excavator has removed the overburden, taken out about 30 ft. of material above waterline and is now working under water.

Digging and conveying gravel from bed of river 300 ft. wide.

When dry pit changes to wet pit, the cableway is supreme.

Typical dry screening plant and Sauerman outfit for local pit.

Rock Products

Vol. XXIV Chicago, January 29, 1921 No. 3

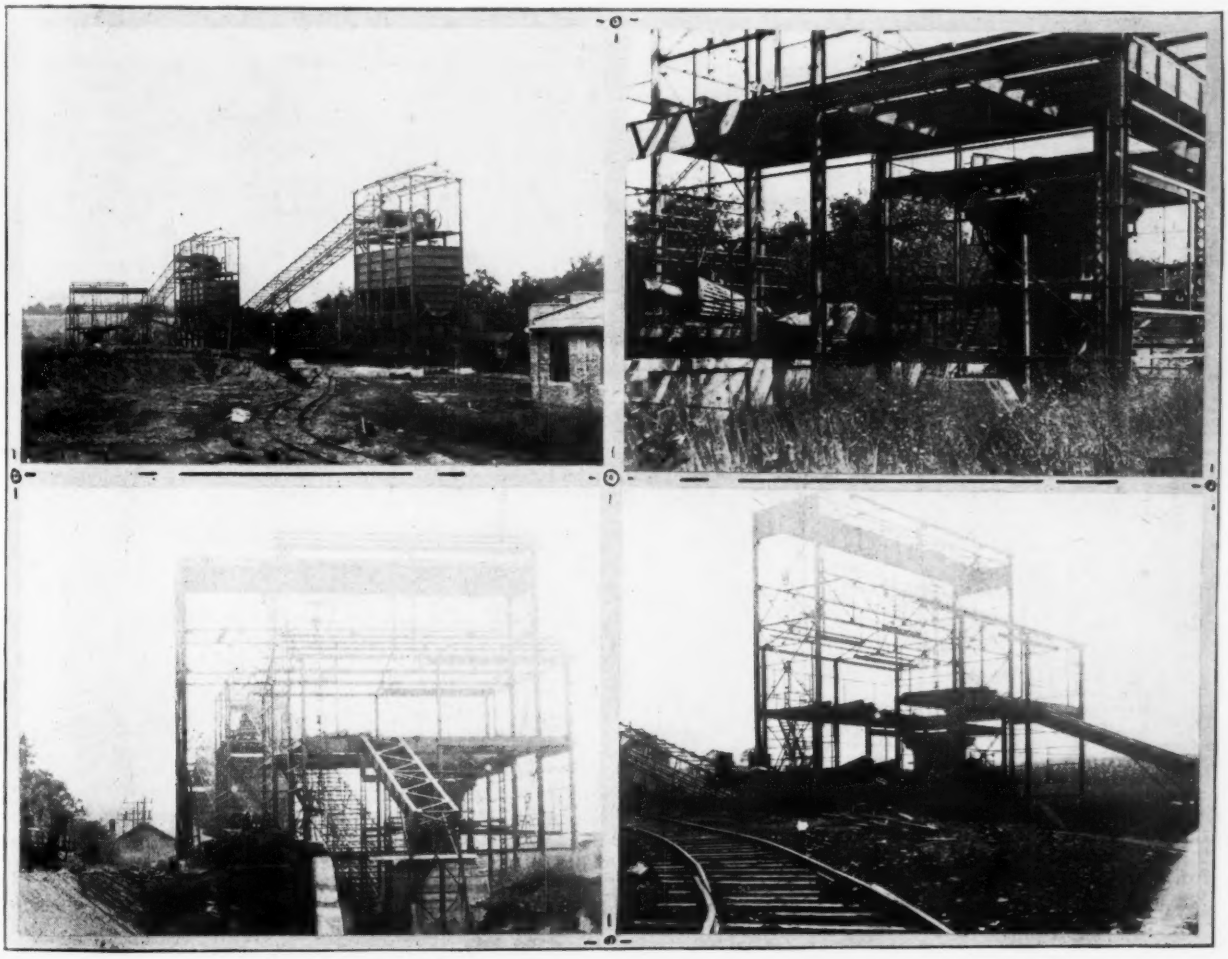
Most Modern Rock-Crushing Plant

Columbia Chemical Company, Zanesville, Ohio, Erects All-Steel Crushing Plant at a Cost of Over Half a Million Dollars — Complete Details

THE NEW PLANT OF THE LIMESTONE products department, Columbia Chemical Division, of the Pittsburgh Plate Glass Co., is rapidly nearing completion and will be in operation within a short period. This plant, said by many to be the world's most modern crushing plant, is located nine miles south of Zanesville, Ohio, near Fultonham. The offices of this department are located in Zanesville, while the main office is Pittsburgh, Pa., and the Columbia Chemical Division office and works are located at Barberton, Ohio.

This new plant is being erected to supply the raw limestone for the Columbia Chemical Division at Barberton, which heretofore has always purchased limestone from the various limestone companies. The plant was designed entirely by the company's engineers and the machinery purchased from the various manufacturers who specialize in this class of equipment.

The plant when completed will have a maximum capacity of 7500 tons of stone per day, but it is not intended to run to this capacity except in cases of emergency. The Columbia Chemical Division at Barberton will require 1200 tons of



Construction details of crushing and screening units

stone per day, seven days per week, of kiln stone in sizes from 4 in. to 8 in., and 400 tons per day of 1 in. to 2 in. stone for the rotary kilns.

The quarry cars are of 10-ton capacity each, two of the cars being hauled up the incline leading from the quarry floor to the first floor of the crusher building, here dumping into the crusher hopper.

Unit No. 1

This plant is built in three distinct units, the first unit being the crusher house and the second and third units being screening houses. Unit No. 1 contains a No. 50 "Superior" (Worthington) gyratory crusher, having two receiving openings 50 in. by 13 ft. This crusher is large enough to take the largest stone that a 5 cu. yd. dipper will load on the quarry cars. It is the second largest gyratory crusher in operation, the exception being that of the Michigan Limestone & Chemical Co., at Rogers City, Mich., which is a No. 60 "Bull-Dog" crusher (Traylor).

From the crusher the stone is distributed into a steel receiving hopper having a capacity of 25 tons, under which is located a 6-ft. steel apron feeder, which feeds the stone in a uniform stream to a 36-in. belt conveyor of 256-ft. centers, with a rise of 70 ft. The belt conveyor deposits the stone in the No. 1 screen, in in Unit No. 2.

Unit No. 2—Scalping Screen and Bins

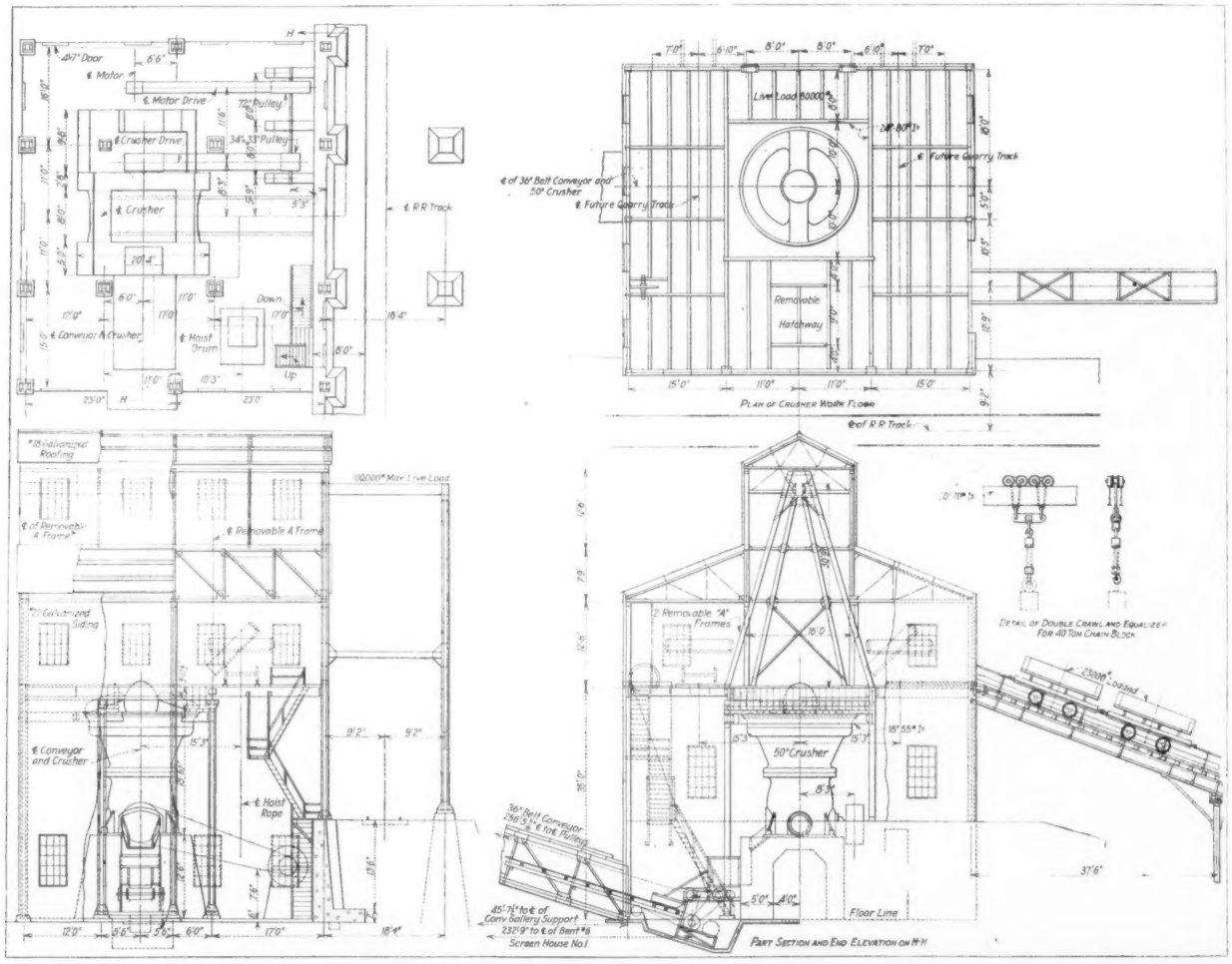
Screen No. 1 is 7 ft. in diameter, 24 ft. long, built in two sections, and with a 1-in. dust jacket. It is built of specially heavy construction so as to handle the large size stone which will be required of it. In passing through this screen, all the dust and less than 1-in. are screened out and discharged into a shaking screen underneath, which separates all the limestone dust and screenings up to ½ in., discharging it by belt conveyors to cars as waste material. All stone from ½- to 1-in. is separated and discharged into a bin below of 200 tons' capacity, while the stone from 2-in. to 3½-in. from the second section of the rotary screen is discharged into a bin of 250 tons' capacity. The stone from 3½-in. to 8-in. passes out the end of the screen as rejections into a bin of 500 tons capacity. Standard gauge tracks parallel this bin building on both sides and here all of the 3½- to 8-in. stone is loaded direct into cars to go to the Columbia Chemical Division at Barberton.

The 4x10-ft. shaking screen is underneath the 7-ft. by 24-ft. screen and receives the material from the dust jacket of the rotary screen (1-in. and under) taking the ½-in. and less out of this material and depositing clean material in a storage pocket feeding the belt conveyor.

Secondary Crusher

Underneath the bins in Unit No. 2 is located a 36-in. by 48-in. single roll crusher, having a capacity of 200 tons per hour, working on stone from 1-in. to 8-in. This crusher is fed direct by a 4-ft. steel apron feeder, so that all 2-in. to 3½-in. stone can be uniformly fed and crushed to 1- to 2-in., making it available for the rotary kilns at the Barberton plant, and for the various sizes of concrete and road stone. The 3½- to 8-in. size rock can be chuted from its bin to the roll crusher.

By this arrangement all the undersized



Plan and elevation of crusher house. Note: Trolley girder supported from sides of crusher house instead of "A" frame shown

shaft-kiln stone, and if necessary the 3½-in. to 8-in. stone can be reduced to 2-in. and smaller.

As the stone is discharged from the roll crusher it is carried up on a 24-in. belt conveyor of 212-ft. centers, and on a rise of 60 ft., together with all stone from ½- to 1-in., which is by-passed around the crusher and discharged on the 24-in. belt conveyor ahead of the larger sizes. This arrangement prevents re-crushing the stone under 1 in., saves making an excess of fines, and cushions the belt and prolongs its life. It will be seen from the drawing that the material is fed to the belt conveyor in progression from dust to the largest size material it handles, thus insuring maximum length of life to the belt.

Provisions are made in this unit, as the plans show, for a washer, should quarry conditions ever require cleaning the stone in this manner.

F. A. Jones
Manager of the Limestone Products Department, Columbia Chemical Co.

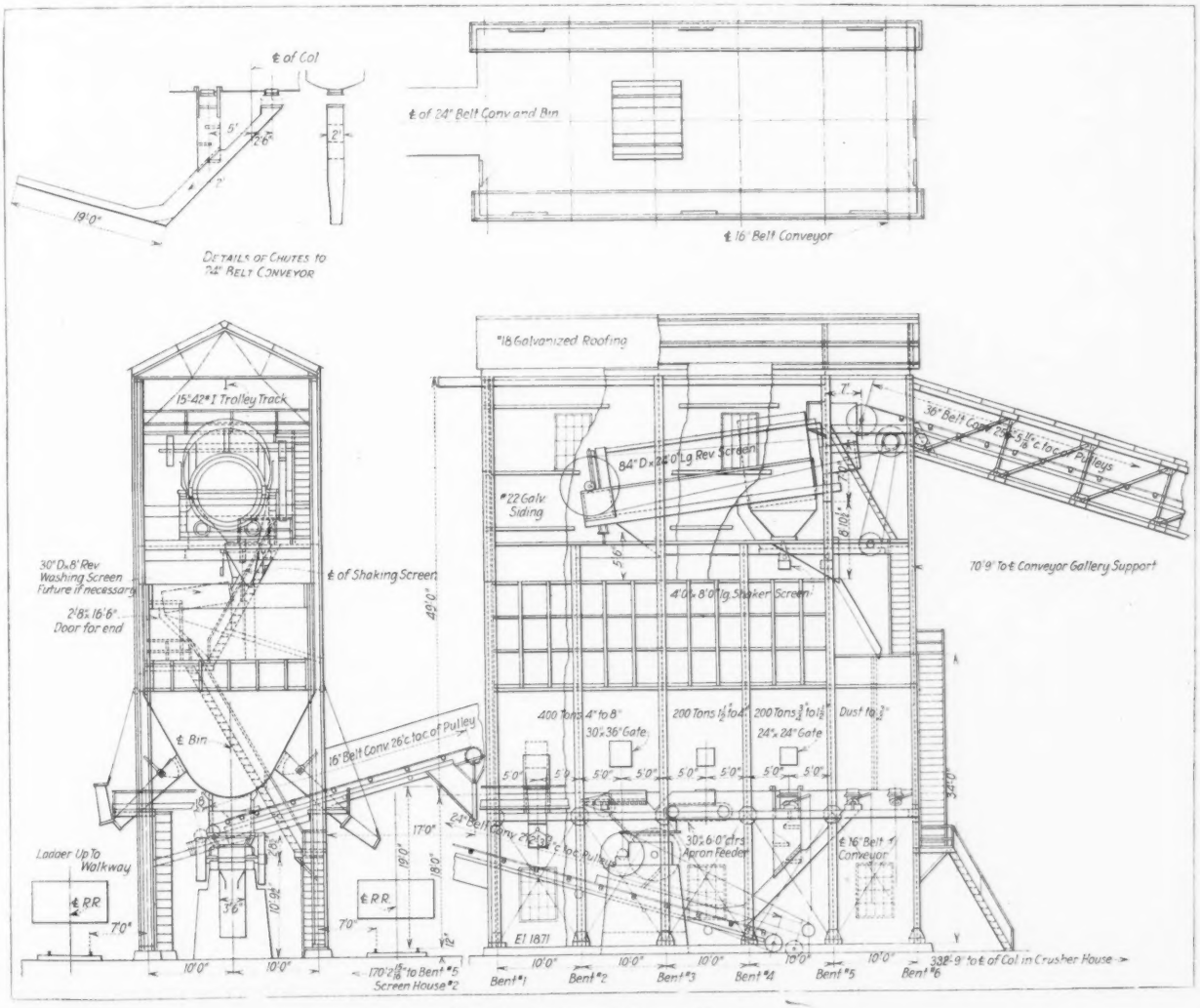
Unit No. 3—Sizing Screen Plant

This 24-in. belt conveyor discharges into a 60-in. by 24-ft. revolving screen equipped with dust jackets and screen sections, so that the stone is separated to four sizes and each size discharged into a 200-ton steel bin. The four sizes made will be from dust to ½-in., ½-in. to ¾-in., ¾-in. to 1¼-in., and 1¼-in. to 2-in. Railroad tracks parallel each side of the screen building and a third track runs underneath the center which allows loading three cars at a time with the various sizes of stone.

Loading Tracks

All of the loading tracks are graded to a one per cent grade, leading down to the track scales at the mill office, which is located at one end of the machine-shop building. Here all the cars will be weighed on a self-recording track scale of 150-ton capacity.

Above the No. 1 screen house (Unit No. 2) tracks for storage of 50 empty



Elevation of screen house No. 1

cars are provided. These tracks are also on a one per cent grade, so that after the empty cars are placed they can all be dropped down, loaded, weighed and run by gravity down into the yards where they will be classified on the various tracks and made ready to be shipped without a locomotive being required to switch them.

After the cars are dropped down and brought to a stop on the scales to be weighed, they are given a kick off the scales and started down to the classifying yard by use of a large compressed air cylinder, which gives them a good start off the scales onto the grade tracks into the yard.

Design of Plant

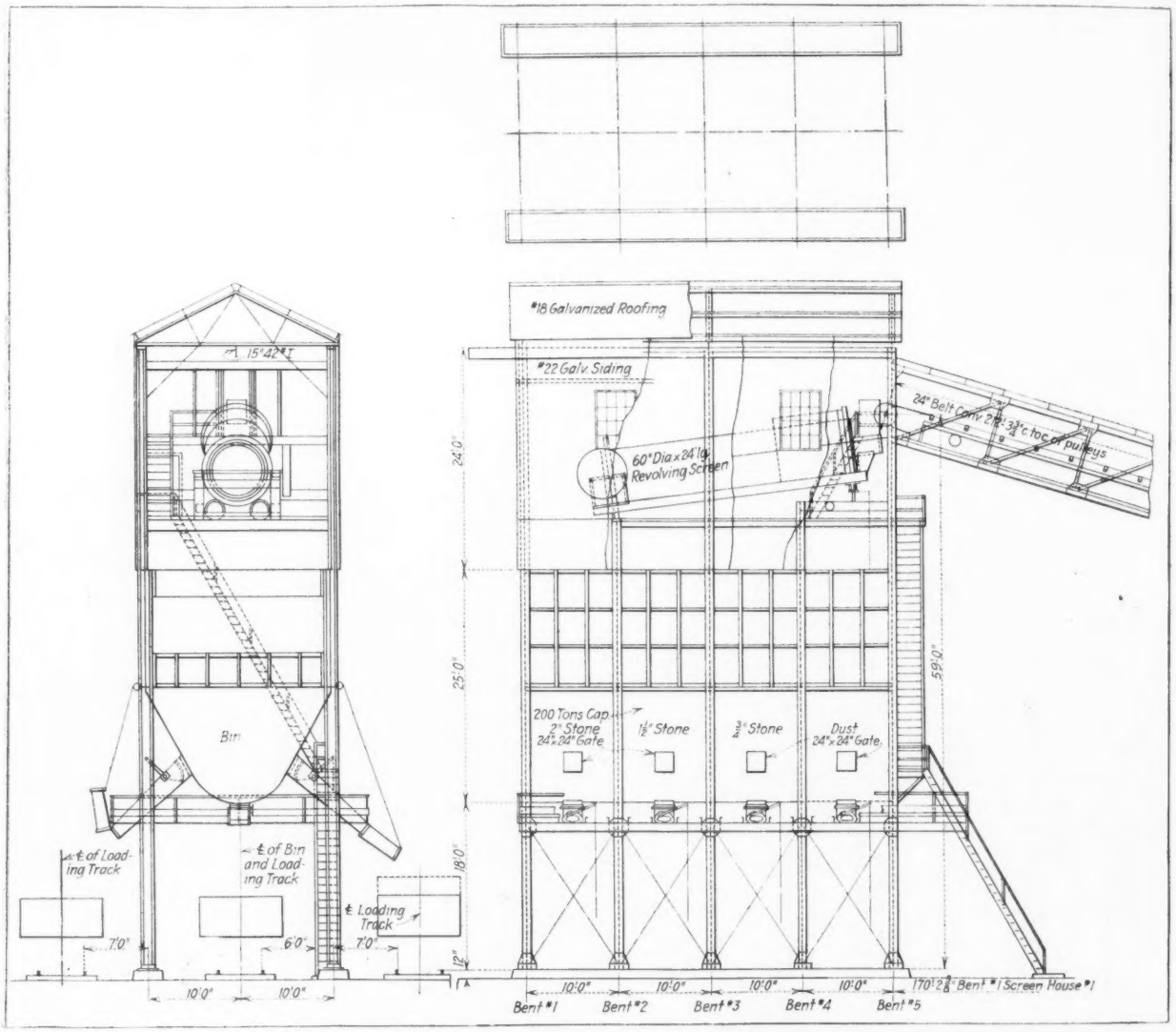
In designing this plant much care and forethought has been given to utilizing all the latest machinery designed for this special work, so that a minimum amount of labor will be required. These details include the very large crusher and the 5-cu. yd. dippers on the steam shovels. The blasting and quarrying expense will thus be reduced to a minimum.

In laying out and designing this plant, the company's engineers have had the help and experience of the engineering staff of the power and mining division of the Worthington Pump and Machinery Corp., which furnished the large gyratory crusher and the screens. The Robins Conveyor Belt Co., furnished the belt conveyors and assisted in laying these out according to what experience has found to be the most practical and economical arrangement, with the result that this plant represents what might be said to be the "latest word" in a large crushing plant operation.

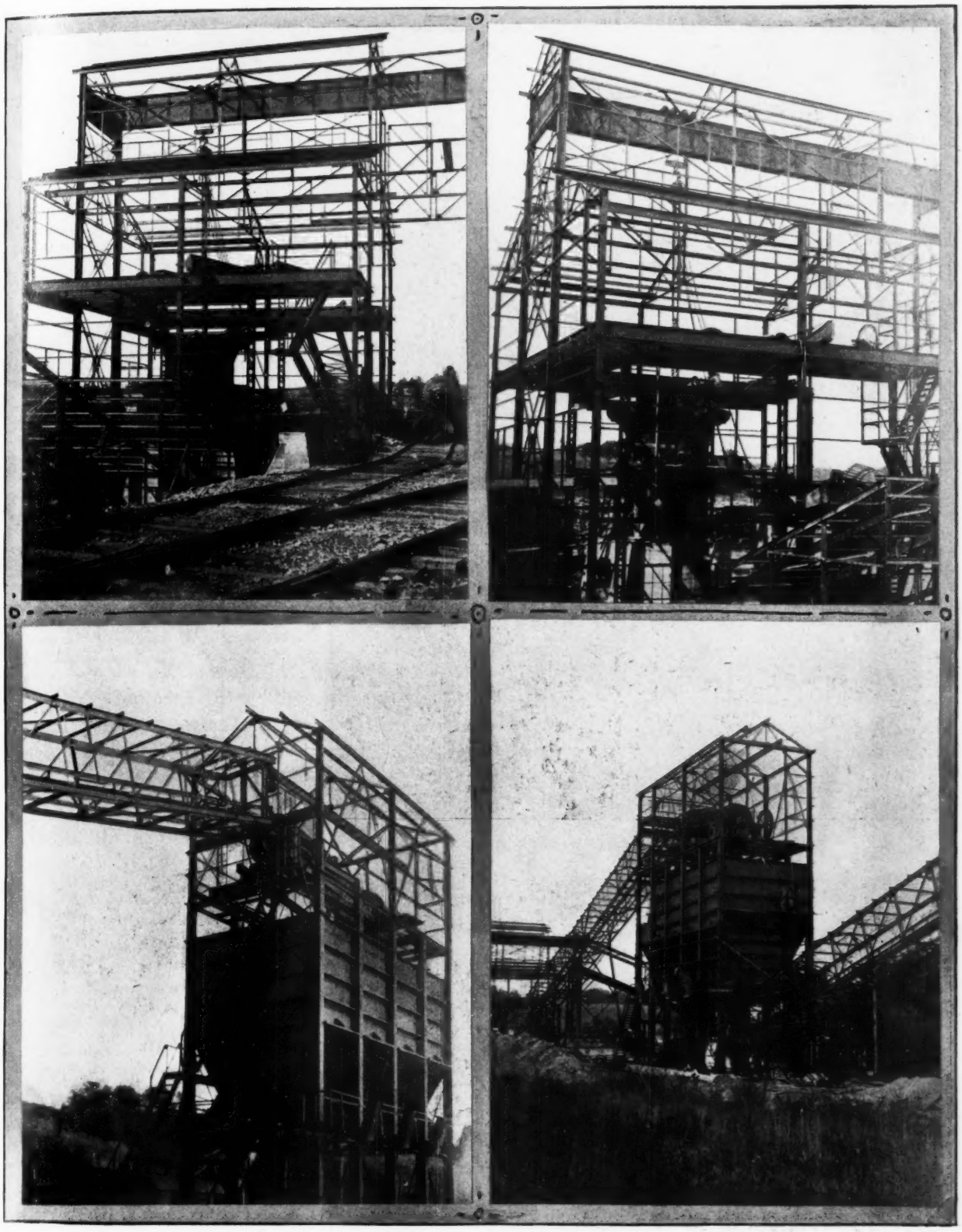
Construction of Plant

The crusher building and the two screen and bin buildings are all of heavy steel construction, fireproof and covered with corrugated galvanized sheeting. In the crusher building is installed a 40-ton trolley which was used in erecting the crusher and will be ready at any time to move the top spider and shaft in case of repairs or rebabbitting of the eccentric. This traveling chain hoist is designed to run from the crusher house out over the switch track at the east side of the crusher, and, while only of a 40-ton capacity easily lifted the center shell of the crusher which weighs 57 tons from the cars carrying it to the center of the crusher house and placing it into position on the foundation. The main shaft of this crusher is 30 in. in diameter, with a crusher head, weighing 44 tons; the whole crusher weighs 252 tons.

As can be seen from the accompanying drawings, the construction of the crusher-house floor, is rather unique, in that there



Elevation of screen house No. 2. Note three loading tracks



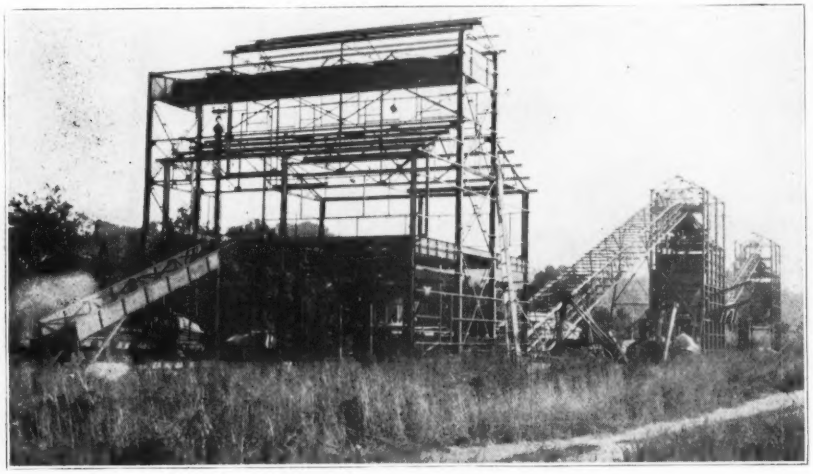
Top—Construction views of crusher house. Bottom—Skeleton for belt conveyors in screen houses Nos. 1 and 2

are no columns above the crusher floor level. This gives a clean floor and provides ample space for installation of another dumping track on each side, should another incline be constructed from the quarry.

In the drawings shown here an "A" frame is provided for supporting the trolley girder. This was changed and the trolley girder is now supported by cross beams, from the frame of the building, because it made construction much easier and cheaper. The trolley girder is designed to carry a load of 120,000 lbs. (60 tons).

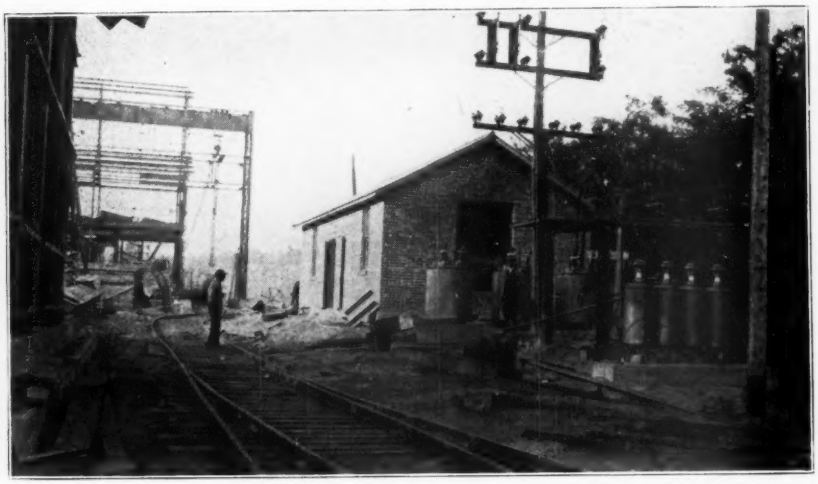
Another feature of construction in the crusher house is that the side of the building facing the loading track is entirely removable because it is bolted in place only. This was so designed as to facilitate the placing or replacing of large castings in the crusher building.

In order to get a spur track from the Zanesville and Western railroad it was necessary for the company to construct a bridge over a river. This is a 2-span steel bridge, each span being 60 ft. long.



Crusher and screen houses

Round house and machine shop



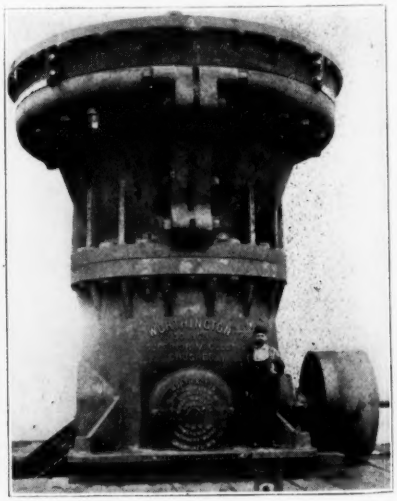
Transformers and sub-station

Power Plant

The whole plant will be electrically operated, the power being supplied by the Ohio Power Co., which has built a high tension line seven miles long from Roseville, Ohio, to the plant at Fultonham. The power will be received by the transformers at the plant at 22,000 volts and stepped down to 440 volts, 60-cycle, 3-phase, and distributed to each of the different operations. Each circuit has a recording meter, so that the power consumed by each operation can be taken each month and charged to the various departments, and which will admit of an accurate account of all the various operations. Each operation is driven by separate motors which are of the heavy mill type, such as are used in cement mill drives and similar operations.

Nature and Extent of Quarry Land

This company owns 284 acres of limestone land, with a bed of rock 40 ft. in thickness and with an average analysis of 94.10% $CaCO_3$, 2.70% MgCO, 0.25% Si O_2 and 0.45% Al_2 O_3. It is peculiarly



No. 50 gyratory crusher

adapted to the manufacture of soda ash, caustic lime, all of the various grades of bleaching powders, washing compounds, chlorinated lime, etc., besides being a splendid blast furnace flux stone, and which ground raw it makes a high grade agricultural limestone. It is of a very hard nature, having passed all of the requirements of the Ohio State Highway Commission for road making.

Quarry Equipment

The equipment of the plant comprises two 90-ton steam shovels with 5-cu. yd. dippers and one 70-ton shovel with a 3-cu. yd. dipper, to be used as a spare shovel in case of emergency or repairs being made to either of the two 90-ton shovels. There is also a 30-ton tractor steam shovel used for stripping purposes only. For drilling the stone two well drills will be used. These are of the heavy type equipped with electric motors for operating them.

For service in the quarry thirty 10-ton capacity steel quarry cars will be utilized, while two 30-ton saddle-tank standard gauge steam locomotives will serve the steam shovels, and one 40-ton saddle-tank locomotive will do the switching of the empty cars onto the loading tracks and tend the stripping shovel during the summer months when stripping operations are being carried on.

In connection with the plant there has been erected a large fireproof brick and concrete machine shop and locomotive house combined, which will facilitate quick repairs to the machinery and also house four locomotives. The machine shop equipment consists of a radial drill, vertical drill, emery wheel grinder, engine lathe, threading machine, key-seating machine, and a complete forge equipment.

F. A. Jones, Engineer and Manager

This plant is expected to be in operation about January 1, 1921, and when completed will represent an expenditure of over $500,000, and will assure an adequate supply of raw material for the Columbia Chemical Division, at Barberton, which is of greatest importance to that department with its investment of millions of dollars.

F. A. Jones, who is manager of the Limestone Products Department, Columbia Chemical Division, is the man who is chiefly responsible for this plant. Mr. Jones was manager of operations of the Kelley Island Lime and Transport Co. for a number of years and is one of the foremost lime and crushing plant experts in the rock products industry.

Increased Production of Magnesite in 1920

THE DOMESTIC MAGNESITE industry as a whole enjoyed a good year in 1920. The quantity of magnesite mined exceeded that mined in any previous year except 1917. Notwithstanding the contention made by the domestic producers in 1919 that without a tariff the market in the Eastern part of the United States would be supplied with European magnesite and that companies which had made large investments in magnesite deposits and plants in California and Washington would be forced out of business, no tariff legislation was enacted, and the industry seemingly has not suffered disaster.

Preliminary figures reported by the United States Geological Survey, Department of the Interior, indicate that the production of crude magnesite in Washington was about 235,000 short tons, as compared with 106,200 tons in 1919. Practically all this was dead-burned and was sold as refractory material to steel companies and manufacturers of refractory products east of Chicago. The figures for California are not yet available, but the output of crude magnesite in the state was about 60,000 tons. California and Washington are the only producing states and the total output for the United States was therefore probably between 275,000 and 300,000 tons.

The imports entered for consumption from January 1 to September 30, 1920, amounted to 20,730 tons of crude and 10,439 tons of calcined magnesite, as compared with 6381 tons crude and 9471 tons calcined entered in 1919. Estimated as crude magnesite the imports for the first nine months of 1920 were about 41,600 tons, as compared with 25,300 tons in 1919. The imports in 1920 probably amounted to about 50,000 tons of crude magnesite, or double those of 1919.

On Jan. 13, 1920, the Senate Finance Committee held a hearing at which users and importers of foreign magnesite presented their objections to a tariff on magnesite.

An investigation of the relations of time, temperature and size of particles in the decomposition of magnesite was made during the year by the Bureau of Mines in co-operation with the Northwest Magnesite Co. at the mining experiment station at Berkeley, Calif. An electrically heated rotary furnace was used for these experiments in calcination, and the samples of crude magnesite used were obtained from mines in California and Washington.

Experiments with magnesite from Washington that has been used exclusively as refractory material are said to show that it is suitable also for use as plastic material, and preparations are being made to calcine it at the mines near Valley, Wash., for use in cement.

Phosphate Rock in 1920

THE NOTABLE FEATURE of the phosphate rock industry in 1920, according to the United States Geological Survey, Department of the Interior, was the increase in production in the Western States. The shipments from mines in Idaho ran from 2,000 to 3,500 tons a month in the early part of the year but were more than 8,000 tons in a single month after midsummer. About 20,000 tons were shipped before July, more than in any previous entire year. The total output of the Western States in 1920 is estimated at 65,000 tons, in comparison with 17,000 tons in 1919.

Early in the year reports were published that a contract had been made for large shipments of Idaho phosphate rock to Japan. Several hundred tons were shipped from the Idaho field to Yokohama in March, May, and June, but regular shipments were not continued. A large part of the Idaho output was sent to points on San Francisco Bay, and a few shipments were made to Chicago and farther east. Several thousand tons were sent to Anaconda, Mont., for conversion into acid phosphate at the new fertilizer plant of the Anaconda Copper Mining Co., built in connection with its smelter.

Shortage in the supply of freight cars hampered the industry in Tennessee, but the production of the old and some of the new companies was probably considerably greater than in 1919.

Operations on Florida phosphate were pushed throughout the year and the push made up in part for the loss caused by the long strike in 1919. The shipments from the pebble field were probably more than 2,000,000 tons, and it is estimated that the total shipments from the State were as great as those in the peak year, 1913, and may even have surpassed them. The demand for phosphate for exportation was good, and many shipments were made to Northern Europe.

Total production of phosphate rock in the United States in 1920 was about 3,265,000 long tons, as compared with 2,249,000 tons in 1919.

Phosphate lands in the Western States that have been withdrawn from entry for several years are now open for leases and permits, which will be issued by the General Land Office. The minimum royalty is 2 per cent of the gross value of the output, and a rental of 25 cents an acre will be charged for the first year, 50 cents an acre for each year from the second through the fifth year, and $1 an acre annually thereafter. No leases will be given for more than 2,560 acres.

Ohio Macadam Association Holds Annual "Academy"

Leading Lights of the State, Noted as the Mother of Presidents, Gather Under the Auspices of Crushed Stone Association

IF PUBLICITY and the good-will of the judicial, legislative and executive branches of a state government and the general public are valuable association assets, the Ohio Macadam Association occupies an enviable position in the roster of material men's associations, for its annual banquet has become a state institution where the leading lights in all branches of state activities gather and dispense wit and wisdom to a *selected* group of representative citizens.

The program this year, Jan. 18, included after-dinner talks by the chief justice of the Supreme Court of Ohio, and by two of his associate justices; the lieutenant-governor of the state, the attorney-general and the ex-attorney-general of Ohio, the speaker of the House of Representatives of the state assembly, the state superintendent of public instruction, the master of the State Grange, the president of the Corn Club, and the inimitable John Henry Newman, state librarian.

Boost Macadam Roads

Many good words were said for macadam-type roads. Col. James G. Johnson, supreme court justice, who saw service in the front-line trenches in France, paid macadam roads high tribute, and he wants to see them built in this country as they are in France—with a metal thickness of 4 or 5 feet. Glory be to the quarry industry if that day ever comes!

A large part of the audience was composed of members of the Ohio state legislature, and many urgent appeals were directed to them to see that laws are passed to properly maintain roads upon which millions of dollars have already been spent. The patrol system of maintenance was generally advocated.

Secretary A. P. Sandles conducted his "academy of wits and wisdom" in his usual inimitable way, robbing supreme court justices of the awe and reverence they generally inspire among the laymen and, as one of them remarked, "treating them just like anyone else."

Business Meeting

The annual business meeting of the Association was devoted largely to a discussion of ways and means. The Association is in a thoroughly healthy financial condition and its monthly magazine "Macadam Service" has become a power in the state for spreading the gospel of macadam roads and agricultural limestone. Its present circulation is about 7,000 and it is hoped to increase this soon to 10,000.

The issues before the crushed stone industry of the nation were discussed in some detail and there is sure to be a bigger representation of Ohio quarry men at the National Association meeting at Toronto this year than ever before. There seems to be a good deal

L. H. Hawblitz
President, Ohio Macadam Association

of sentiment among the Ohio quarry men that continual agitation of the high freight-rate problem in the public print is actually encouraging local quarry and gravel pit operation.

The prospects of road-building in Ohio were never better than they are now, according to discussions at this meeting, and there is every reason to believe the Ohio quarry men face a very prosperous year. The general sentiment was that labor and other operating costs *will not* be appreciably reduced this year and that the situation the quarry men find themselves in calls more for stabilization of the industry than any reduction in prices, which reduction in costs does not now justify.

Old Officers Re-Elected

The officers elected for the year 1921 are the same as served in 1920 and in 1919. They are president, L. H. Hawblitz, France Stone Co., Toledo, O.; first vice-president, E. T. Paul, Bluffton-Lewisburg Stone Co., Lewisburg, O.; second vice-president, J. A. Moore, Higgins Stone Co., Bellevue, O.; treasurer, W. H. Hoagland, Marble Cliff Quarries Co., Columbus, O.; secretary, A. P. Sandles, and assistant secretary, Claude Clark.

Road Machinery Exhibit at Chicago, Feb. 9-12

FOR THE SECOND TIME IN ITS HISTORY, the Federal Bureau of Public Roads will make an elaborate exhibit outside the National Capital, when it stages a demonstration of its work at the American Good Roads Congress to be held at the Coliseum in Chicago, Feb. 9 to 12 next. The Bureau is preparing to ship considerable equipment to Chicago, and several of the Bureau officials will occupy prominent places on the program. Features of the government exhibit will be actual demonstrations by the Division of Tests in the conduct of the impact tests that the Bureau is using to determine the ability of different soils to sustain roads and to measure the amount of wear on road surfaces caused by heavy traffic.

The new Congress will be urged, according to the program formulated by the American Road Builders' Association to extend for five years the federal road-building program, which by law terminates with the close of the government's fiscal year. Congress will be urged to provide additional funds for expenditure under the terms of existing legislation, and the newly formed program of the Congressional leaders at the rate of at least $100,000,000 for each of the five years, beginning July 1, 1921. In the advocacy of this procedure, the American Road Builders' Association will be in hearty accord with the attitude expressed by Secretary of Agriculture Meredith in his recent annual report.

The Association includes in its membership the highway officials of the national government and those of the states, counties, cities and townships in the United States and Canada, together with highway engineers and contractors.

All Out for Toronto!

Crushed Stone Men Plan Interesting and Instructive Program for Annual Meeting, February 7, 8 and 9

THE FOLLOWING TENTATIVE PROGRAM has been issued from the office of Secretary A. P. Sandles, of the National Crushed Stone Association, 405 Hartman Building, Columbus, Ohio:

Headquarters and Convention Hall: King Edward Hotel.
Registration and get acquainted.
Meeting of Executive Committee and Directors.
Convention called to order. John Rice, President, National Crushed Stone Association, presiding.
Canadian welcome and greetings.
Response—B. D. Pierce, First Vice-President, National Crushed Stone Association; E. J. Krause, Second Vice-President, National Crushed Stone Association.

FIRST DAY

Traffic Committee's Report.
Report of Compilation of Cost Production reports.
Tour of the City.
Visiting at homes of Toronto friends.
Dinner at six.
Hockey Match on Ice.
Concert, Smoker, story telling, shop talk.

SECOND DAY

Group meetings in forenoon as follows:
(Each group will select its own chairman and secretary)

Ballast Group.
Fluxing Group.
Agricultural Lime and Limestone Group.
Highway Group.
Mineral Aggregate Group.

(Place of holding group meetings will be announced first day. Last year these group meetings were highly profitable to all who attended)

SECOND DAY (Afternoon)

B. D. Pierce, First Vice-President, presiding

President's Address, John Rice, General Crushed Stone Co., Easton, Pa.
Discussion of President's address.
The Esch-Cummins Bill.
The Open Shop.
Freight Rates.
Mileage rate schedules.
Co-operation with Sand and Gravel.
Future policy and program of the National Crushed Stone Association.
Standardizing stone sizes.
Should our Association have a member on different committees of the American Society for Testing Materials?
Banquet and Entertainment.

THIRD DAY (Morning)

E. J. Krause, Second Vice-President, presiding

Group meetings from 9 to 10 A. M.
General meeting.
Group reports received, general discussion and action thereon. Addresses by representatives of U. S. Bureau of Roads; Interstate Commerce Commission, and Ontario's Minister of Highways, Mr. Biggs

THIRD DAY (Afternoon)

General Session. John Rice, President, presiding
Workmen's Compensation and insurance rates.
Sale and exchange of used machinery.
How can stone industry win favor with: (a) Architects. (b) Engineers. (c) Manufacturers. (d) Chambers of Commerce. (e) Railroads. (f) Public Officials. (g) Social and Business Clubs.
Report of Secretary and Treasurer.
Committee reports.
Election of Directors and officers.
Discussion of Budget for ensuing year.
Miscellaneous business.
Adjournment.
Directors' Executive Meeting.

Write direct to W. R. Shaw, Provincial Stone & Supply Company, 200 McKinnon Building, Toronto, Ontario, Canada, for hotel reservation. Officials of the Province of Ontario and the City of Toronto and the Provincial Stone Company will co-operate to make this convention a success and pleasant.

SANDLES.

Hints and Helps for Superintendents

Righting Side-Dump Cars at the Crusher

THE UPPER HUDSON limestone plant of the New York Trap Rock Co., just south of Poughkeepsie, N. Y., has an original device for righting standard side-dump quarry cars, after they have deposited their load in the crusher hopper.

The cars are standard gauge, holding about 12 cu. yd. each. They dump either way from a rocker bearing in the center, being the ordinary contractor, or construction type dump car.

The trains are run to the crusher on a dead end track, the locomotive being in the rear. The side chains on the cars are released and if the load is not sufficiently off center to dump of itself, a pole is inserted under one corner of the car and the train backed up slightly, causing the pole to lift the corner of the car, as in the device described in the January 15 issue of ROCK PRODUCTS at the plant of the Riverside Portland Cement Co.

Before the side chains on the car are released, so that the car can dump, a chain with a counter-weight in the chamber below the track level is attached to the center of the side of the car as shown in the views below. This chain extends through a hole beside the track and has a stop at a fixed point, so that it can not slip down through the hole beyond this point.

The length of chain above the stop is considerably longer than the distance from the ground to the point where it is attached to the side of the car, when the car is in righted position. This of course prevents any tension or pull on the side of car body when it starts to dump the load, and makes it easy to attach the hook to the side of the car.

As the middle view of the three below shows, there is only about 18 in. of chain below the stop when the car body is up-ended, so that practically no resistance to dumping is offered by the counter-weight. But when the car is dumped and empty, the full weight of the counter-weight is hanging to the up-ended side, which immediately gives sufficient pull to bring the car body back to its normal position, automatically.

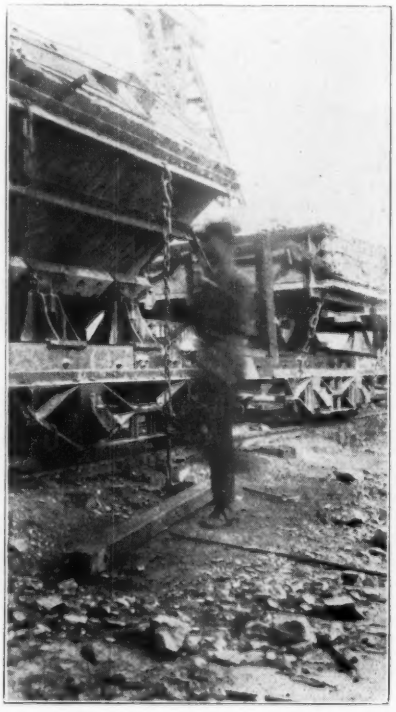
The concrete crusher pit was made sufficiently large so that there is an open space or chamber under the dumping track, as is shown in the third one of the accompanying views. A smaller pit in the bottom of this chamber is built to enclose the counter-weight so that in rising and falling in the performance of its duty, it is not in the way, and there is no danger of its falling on any workman.

The counter-weight has to be adjusted to do what is expected of it without being any heavier than necessary. It consists of an old casting with a few links of chain to give it the required pull and no more.

James G. Shaw is vice-president in charge of operation of the New York Trap Rock Co. As president of the Upper Hudson Stone Co. he built the plant mentioned here.

WE WANT to hear from plant superintendents who have found out ways to do things. Nearly everyone of you has some pet kink up your sleeve. Don't be too modest! Remember, that the next fellow may have something that will be of use to you. Make ROCK PRODUCTS your medium of exchange.

Attaching chain to car



Length of chain when car body is up

Chain with counter-weight in chamber

Novel Way of Erecting Screen

THE TWO PHOTOGRAPHS shown below illustrate a novel method of erecting large screen during the erection of the new limestone crushing plant of the Columbia Chemical Co., Zanesville, Ohio, which is fully described elsewhere in this issue.

The screen weighs 26 tons and one end was lifted up by a 10-ton overhead traveling trolley hoist, which is provided in each screen house, the other end being lifted up by a large locomotive crane, with a 90-ft. boom.

As the chain falls on the hoist were raised, the crane followed up with the other end, and when the screen was high enough to set in on the frame, the crane was advanced up the track and the screen rolled into place on the trolley track. It was then lowered into position and set in on its frame.

The start to raise this screen off the ground was made at 9:00 a. m., and at 11:45 a. m. the screen was landed into place. Considering the weight of the screen and the distance it was hoisted this is indeed a remarkable record, besides being a very efficient method of erecting a screen.

Correct Method of Setting a Ball Joint in a Steam Line

IT HAS MANY TIMES been a subject for argument among shovel runners as to which is the correct way to set a ball joint in a steam line. There is but one correct way.

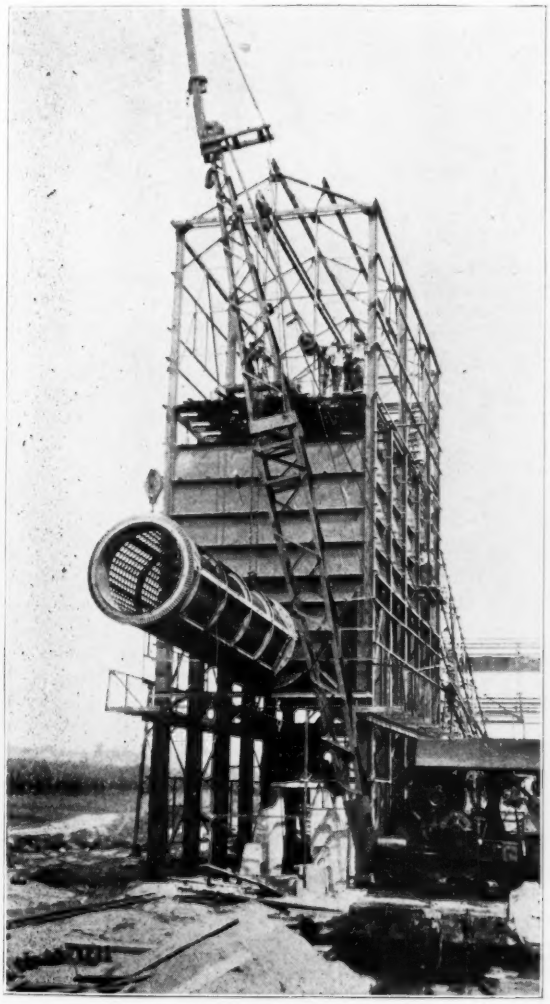
The ball joint consists of the male and the female parts, or in other words, the ball and the socket.

On either end is a nipple connecting the ends of the joint to the steam line. The correct action of the ball joint depends upon there being deflected a sufficient proportion of the oil, which is carried in the steam, for its lubrication.

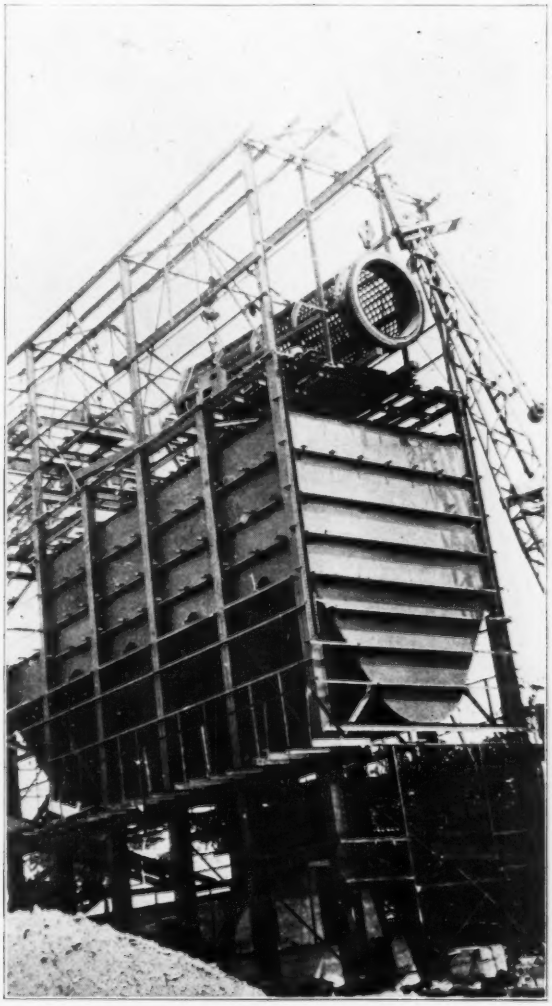
Let us suppose the joint is set in such a manner that the ball is at the top and the socket at the bottom. Let us see what the action of the steam must be with such an arrangement. There is nothing here to deflect the steam and thus catch the oil. It all passes straight through the steam line to the engine. The joint thus receiving no lubrication will soon go dry, will stick and the result will soon be shown in the working loose of the nipples that connect the joint to the steam line.

On the other hand, suppose the socket is at the top and the ball at the bottom. The steam passing through the pipe at the socket is deflected on the ball, a sufficient amount of oil being deposited on the face of the ball to lubricate the joint.

After thinking this over, there should be no further argument.—"The Excavating Engineer."



Raising the screen



Pushing screen into position

Sand and Gravel Men Hold Most Notable Convention of Industry

Crushed Stone Men Given an Opportunity to Join Under Certain Conditions—President and Executive Secretary Present a Constructive Program for 1921

WITH A TOTAL ATTENDANCE of about 150 and with no session of less than about 100 interested producers, the sand and gravel industry of America held the most important convention in its history at the Seelbach hotel, Louisville, Ky., January 12, 13 and 14.

Undoubtedly, the most important and far-reaching action taken by this convention was the adoption of a change in its constitutional provisions regarding qualifications for membership. This change will make it possible for crushed stone and crushed slag producers to join the Association under certain provisions, as noted further on.

Discussion of Proposed Amalgamation of Mineral Aggregate Associations

The matter of changing the constitution of the National Association of Sand and Gravel Producers to pave the way for a National Mineral Aggregate Association had been given a most thorough study by a committee of three, John Prince of Kansas City, Mo.; George J. Nattkemper of Terre Haute, Ind.; and H. H. Halliday of Cairo, Ill.

After thorough investigation of all phases of the problem, this committee reported to the convention on the second day of the sessions, a unanimous report. In presenting this report, John Prince, chairman of the committee, reviewed the entire history of the movement for a National Mineral Aggregate Association and stated that he believed the committee had adopted the only logical course to pursue under the circumstances.

As a preliminary, the report stated (1) that it had been found that a United Mineral Aggregate Committee had been active in promoting a National Mineral Aggregate Association (which committee had no direct connection with any one of the three national associations in the field at this time); (2) that the officers and executive committee of the National Crushed Stone Association had signified that they were not favorable to such an amalgamation; (3) that there are localities where crushed-stone producers are working in perfect harmony with sand and gravel producers, and there are likewise localities where these interests are in active conflict; (4) that crushed stone producers have actually contributed over $1,000 to the treasury of the National Association of Sand and Gravel Producers, and have asked to be allowed to contribute to the support of the Association in a regular manner; (5) that a real amalgamation of all three interests cannot be effected at this time.

Having thus introduced the subject, the committee recommended a change in the constitution to admit crushed stone and slag producers under certain conditions. This provision was the subject of much discussion and revision before it was finally adopted. A motion to strike it out of the committee's report entirely was lost by a nearly evenly divided vote. In its final form this provision reads as follows:

ANY PERSON, firm or corporation of the United States or Canada engaged in the production and sale of any mineral aggregate, shall be eligible to membership in this Association, provided, however, such person, firm or corporation engaged in the sale or production of any mineral aggregate other than sand and gravel, shall be either a member of a State or District Association including sand and gravel producers, or the principal place of business of such producer shall be in a State where there is no association of sand and gravel producers, in which event his application shall be recommended by two members of this Association.

This provision was adopted on the last day of the convention by a considerably better than the two-thirds majority necessary, and on the motion of W. P. Carmichael of St. Louis, was subsequently made unanimous.

Other minor changes in the constitution were made, but no change in the name or objects of the Association as outlined in its present constitution were suggested or considered.

How the Matter Stands

In the language of President V. O. Johnston, the Association has done the *courteous* thing in opening its doors to any mineral aggregate who desires to affiliate with it, and he has been assured in the course of his travels throughout the country that there are many such producers of materials other than sand and gravel.

Sentiment in favor of the amendment came mostly from members or spokesmen in the states of Wisconsin, Nebraska, Minnesota, Texas, and Illinois, where mineral aggregate associations are already in successful operation, or are about to function. Opposition to the move came almost entirely from members in those states and localities where there is a fundamental difference in policies as between organizations of sand and gravel and those of crushed stone men, such as in Indiana, Ohio, and possibly some eastern states.

The provision of the new constitutional requirement for membership attempts to take care of this local conflict by requiring that a prospective crushed stone or slag member must have demonstrated his ability to live in peace and harmony with his local sand and gravel competitor, by being a member of a local mineral aggregate association or, in case there is no association of any kind, he must be recommended by at least two of his local sand and gravel competitors.

In view of the fact that there are no crushed stone or slag members at this time, the committee considered it would be presumptuous, to say the least, to change the name of the Association or make other changes in the constitution which would imply that the present Association is anything other than a sand and gravel men's organization. It was the object of the committee, however, to give

Officers of the National Association for 1921

PRESIDENT—V. O. Johnston, Lincoln Sand and Gravel Co., Lincoln, Ill.

VICE-PRESIDENT — George J. Nattkemper, Summit Sand and Gravel Co., Terre Haute, Ind.

TREASURER—John Prince, Stewart Sand Co., Kansas City, Mo.

EXECUTIVE COMMITTEE—A. P. Burk, Atlanta Sand and Supply Co., Atlanta, Ga.; Alex W. Dann, Keystone Sand and Supply Co., Pittsburgh, Pa.; Floyd Goodrich, Humboldt Gravel and Tile Co., Humboldt, Iowa; Charles L. Ruffin, Massaponax Sand and Gravel Co., Fredericksburg, Va.

The STEERING STAFF of the Sand and Gravel Industry

A.P. BURKE, *Committee*

A.W. DANN, *Committee*

G.J. NATTKEMPER, *Vice-President*

V.O. JOHNSTON, *President*

JOHN PRINCE, *Treasurer*

FLOYD GOODRICH, *Committee*

E. GUY SUTTON, *Executive Secy.*

C.L. RUFFIN, *Committee*

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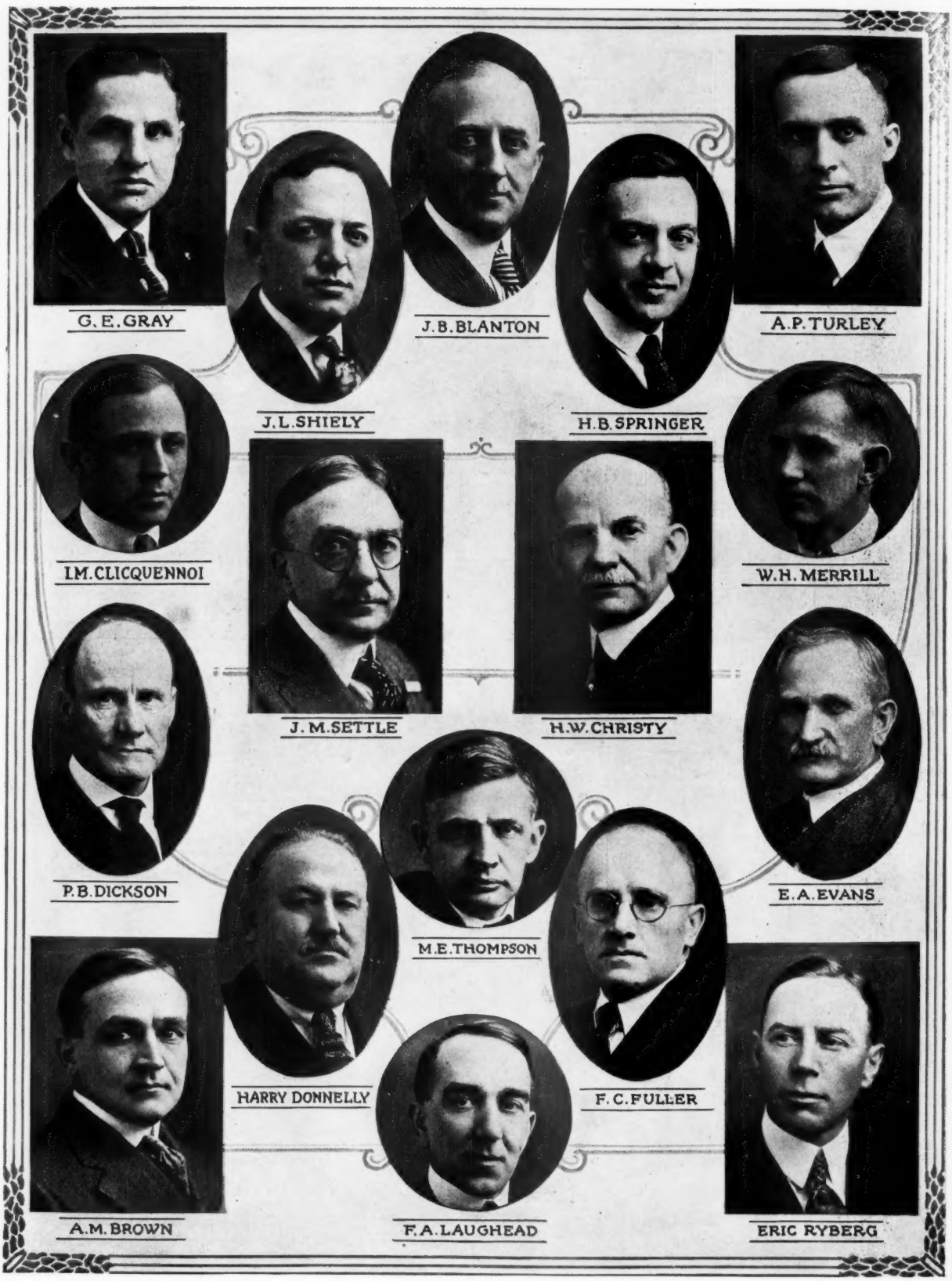

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Sand and gravel men from all corners of the country

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Sand and gravel men from all corners of the country

crushed stone and slag members all the rights and privileges of members, and when these new members are sufficiently strong in numbers to justify it, they will undoubtedly be given separate representation on the executive committee and in the management of the Association, if they so desire it.

Program and Activities of the National Association

In his address at the opening session of the convention, President Johnston spoke with justifiable pride of the achievements of the Association in 1920—a year memorable for the hard knocks the industry received at every turn. He made it clear that while the record did not show the accomplishment of all that was desired, the great achievement was the establishment of those contacts with government bureaus and other national agencies, so very essential to further progress of the industry in a national way.

The accomplishments of the Association in 1920 and its program of activities for 1921 are given in detail in the accompanying annual report of E. Guy Sutton, executive secretary of the Association:

In accordance with the recommendations voted by the last annual convention, the National Association, during the past year, has directed its efforts primarily in dealing with four matters that are of vital importance to the sand and gravel industry, namely: Car Supply, Freight Rates, Specifications, and Membership. I shall treat these subjects in the order I have mentioned them.

Car Supply

As an introduction to the question of Car Supply, and in order to demonstrate that we were keenly alive to the situation, I wish to quote as follows from my last annual report:

. . . The transportation demands of the country have increased faster than the transportation facilities. Until this unbalanced relation can be adjusted, sand and gravel producers, as well as other shippers, must face and endure inadequate service from the railroads. How long it will take to bring about a proper adjustment is problematical. The very best that we may expect in the meantime is to receive the proportionate share of cars to which we are rightfully entitled. . . . The Interstate Commerce Commission will have authority to regulate the distribution of cars. . . . This function will probably be administered through a Car Service Division . . . the establishment of which has already been decided upon by the Association of Railway Executives. . . . There will naturally arise a keen competition for cars between shippers of various commodities, and especially will this be the case between the coal operators and the producers of mineral aggregates, as the former, through their well-financed organization, will employ their usual tactics in attempting to obtain preferential treatment.

Thus, anticipating the transportation difficulties to be encountered, we began to marshal our forces early in the year in an effort to obtain for sand and gravel producers their fair share of open-top cars. A working relation was established with the Commission on Car Service, which body was reorganized by the American Railroad Association at the conclusion of federal control. Arrangements were perfected whereby that agency would investigate cases of inadequate car supply; this plan resulted in a marked improvement in the service accorded a great many producers. As a matter of fact, there were very few reported instances of discrimination in the distribution of cars previous to the middle of May, but that were satisfactorily straightened out.

The real difficulty, of course, began after the officials of the railroads acknowledged their inability to cope with the conditions that developed as a result of the congestion of terminals and the disarrangement of equipment and appealed to the Interstate Commerce Commission to assume the emergency powers granted by the Transportation Act of 1920.

In this connection, I would call attention to the fact that under the provisions of the Esch-Cummins Act the previous order of things has been reversed whereby the Interstate Commerce Commission represents and protects first the interests of the railroads while the public has no source to which to go for relief. In other words, we have reverted, in many respects, to the transportation conditions which prevailed previous to the original passage of the Act to Regulate Commerce 34 years ago, when special privileges were granted to shippers who were powerful enough to force them.

Furthermore, in order to get a clear conception of the situation we must realize that the railroads are now being operated under the general direction of two bodies—the Interstate Commerce Commission and the American Railroad Association, closely allied with the Association of Railroad Executives. The former is financed by the people and the latter by the railroads. These two agencies apparently work in perfect harmony.

Being forewarned, we were on the ground when the petition of the railroad executives was filed with the Interstate Commerce Commission asking that agency to take control. Anticipating as a result of previous experience, that sand and gravel operators would be the first to be denied the use of open-top cars, a petition was prepared and submitted in which we plead that no priorities be issued in favor of any commodity. Following the presentation of this petition, assurance was given in writing by the Commission that no priorities were even contemplated. However, only a short time elapsed before the commission on car service of the American Railroad Association promulgated its Circular CCS-33, giving 50 per cent car supply to the coal mines before cars might be furnished for other loading. A formal protest was made then before the Commission on Car Service against the continuance of this illegal order; it was finally canceled and superseded by Service Order No. 7, issued by the Interstate Commerce Commission.

The first act of the Commission after granting the plea of the carriers was to suspend all rules, regulations and practices of the carriers with respect to the use and distribution of equipment, thus relieving the officials of the railroads from all legal responsibility to the public in the matter of car service.

It is needless to reiterate the details of events that preceded the hearing staged by the National Association and reluctantly granted by the Interstate Commerce Commission for you are all fairly well acquainted with what transpired previous to that memorable occasion. You are also aware that we did not accomplish at this hearing the specific object for which we were striving —that of securing the cancellation of Service Order No. 7. As a matter of fact, the verdict was rendered before the plaintiff was heard in spite of the evidence and arguments we presented demonstrating beyond the shadow of a doubt that the chief result of Service Order No. 7 would be to increase the price of coal. But, the Commission had to justify its own act of which it is the sole judge. However, the Association can be justly proud of the showing made and the incidental benefits obtained:

1. We initiated and effectively carried through a protest against the action of the Interstate Commerce Commission that was nation-wide in its scope and consequence.

2. We succeeded in bringing together for the first time the component members of the construction industry for the purpose of prosecuting a matter of common concern.

3. We demonstrated to the Interstate Commerce Commission and to the railroad organizations that there is a sand and gravel industry which must be reckoned with.

4. We aroused the interest of the members of the Senate Committee on Reconstruction and Production and convinced them of the merits of our contentions.

5. The carriers were awakened to the fact that they must make a determined effort to take care of the general business of the country if they are to escape a reversion to federal control. Following this hearing, they immediately began a campaign for heavier loading, increased daily mileage and reduction in the number of bad order cars and locomotives, all of which tend relatively to enlarge the car supply.

6. In addition to the foregoing, the following ameliorative results were secured:

(a) The release from the provision of Service Order No. 7 of open-top cars less than 36 inches in height. (This was later extended to 38 and finally 42 inches.)

(b) Curbing of the reconsignment privilege.

(c) Drafting of subsequent orders in a manner that more nearly accomplished the purposes desired.

In our endeavors following the hearing before the Commission, we kept two objects in mind—first, to gain temporary relief, and second, to re-establish the equal rights of all shippers in the matter of transportation.

The permit system was established through the Car Service Division, with the approval of the Commission at our solicitation. We prepared the forms that were used for submitting applications; we were notified daily of all permits issued as a part of the routine incident to the operation of the system. Hundreds of sand and gravel producers as well as shippers of other materials profited by this arrangement. This was the prime feature of our program to secure temporary relief though we continued throughout the season to present complaints for shippers who were entitled to cars under proper interpretation of the various service orders. In this connection I would call attention to the fact that the necessity for a greater number of complaints was averted by the general interpretative instructions that were issued by the Car Service Division and the Commission on our representation. Furthermore, the railroad officials came to realize that the National Association

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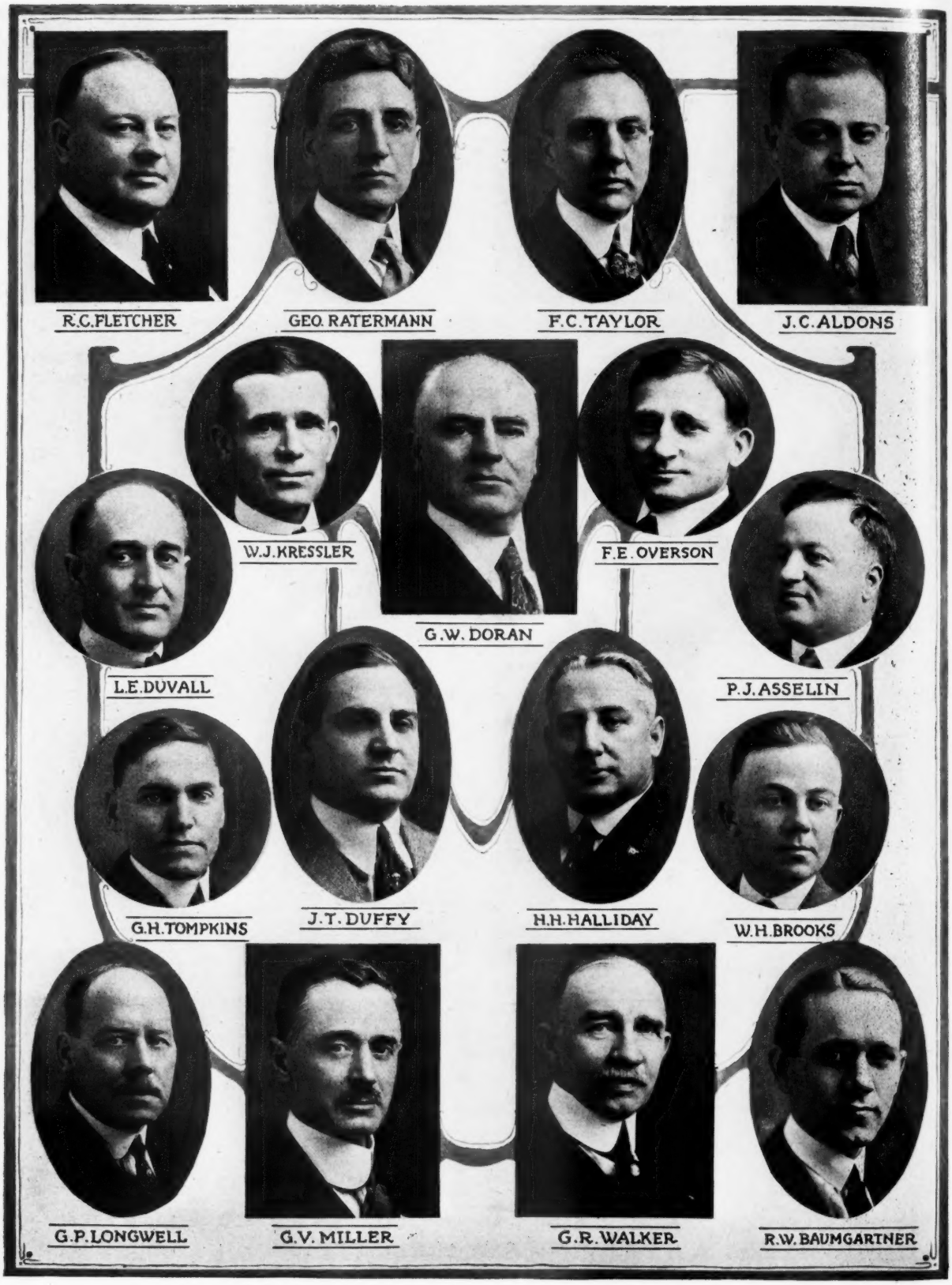
Sand and gravel men from all corners of the country



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stands back of every demand for reasonable service made by any sand and gravel producers. This has had a wholesome effect in many quarters.

As a principal part of our plan to obtain permanent relief we have been working very closely with the Senate Committee on Reconstruction and Production headed by Senator Calder of New York. At the request of this Committee, we have prepared and submitted a proposed amendment to the Transportation Act intended to eliminate the powers of the Interstate Commerce Commission with respect to priorities and preferential car supply. Our suggestion in this regard was well received by the Committee and we have reason to believe that it will be passed on to the Senate Committee on Interstate Commerce with favorable recommendation. I shall expect to present later the amendment referred to for the consideration of the convention.

Freight Rates

The heavy and inequitable advance in freight rates applying on sand and gravel are an undeniable menace to the healthy development of the industry. These materials move on comparatively short hauls and every advance in rates restricts the territory and encourages the opening up of temporary pits. Realizing that these low-grade commodities can stand no further increase in transportation charges the National Association made a strong protest before the Interstate Commerce Commission in the recent case, Ex Parte No. 74, resulting for the first time in getting official recognition of the mal-adjustment of sand and gravel rates in general, as indicated by the following excerpt from the report of the commission:

> The carriers have indicated a willingness promptly to re-adjust rates in cases where hardship results from the general percentage increases, and their special attention is called to the commodities (sand, gravel, stone and slag), to the end that such action may be taken as the facts may warrant.

Under the provisions of the Esch-Cummins Act passed by the last Congress it becomes mandatory for the Interstate Commerce Commission to establish rates such that the carriers as a whole or in rate groups shall earn a fair return on the aggregate value of their properties. The rate of return, as you know, for the two years beginning March 1, 1920, was set at 5½ per cent, after which time the commission shall prescribe the percentage that shall be earned. For the purpose of carrying out this rate-making feature of the law the commission has at least temporarily divided the country into four groups—Eastern, Southern, Western and Mountain-Pacific.

Inasmuch as the commission is enjoined to prescribe rates that will yield a given return, it is doubtful, as in times past, whether the railroad officials of any given line will assume jurisdiction over rate changes, especially insofar as reductions are concerned. Even so, as I view it, it would not be the part of wisdom after the I. C. C. had fixed a percentage increase to provide a given return for the railroads to voluntarily reduce it without the consent of the commission.

Moreover, the railroads are thoroughly organized through the American Railroad Association and the Association of Railway Executives, and for that reason we can hardly expect one railroad to act independently of another in the matter of rates. We must acquaint them with the fact that the hauling of sand and gravel is a profitable business.

Besides, because of the mandatory duty of the I. C. C. to give the railroads a fixed rate of return, the power of the state commissions to regulate intra-state rates, as you are aware, is being seriously questioned on the theory that if the states refuse to grant the rate advances authorized by the I. C. C., as a number of states have already done, and such action is upheld by the courts, then there must of necessity be greater increases on interstate rates to make up the deficit. This at once creates an unjust discrimination between intra- and interstate rates with an unjust burden on the latter, which is unlawful because it works a hardship on the interstate shipper. It, therefore, appears that the freight rate proposition is likely to become a national question, and at best a matter to be considered by states, districts or rate groups. And while I have always taken the position that the matter of freight rates was a local proposition yet I doubt whether it is any longer a question to be settled by bargaining between the producer and the division freight agent of the railroad on which his plant is located.

The advisability of petitioning the I. C. C. to establish a general and uniform principle on which a reasonable level of rates on sand and gravel may be based is now being given consideration by the association. Action in this regard, however, will be deferred at least until the conflict of jurisdiction is settled between the I. C. C. and the state commissions.

Specifications

A few years ago a man engaged in the sand and gravel business felt that he must apologize for the fact. Today the products of his plant are considered basic material and as essential to the progress of the nation and the development of permanent wealth as are steel and cement. Especially is this true of sand, for no modern building project can be constructed without its use. As a result of the increased use of sand and gravel the industry has emerged from the shovel and wheelbarrow stage until now it represents an investment of $150,000,000 with a potential yearly output of 300,000,000 tons. With the development of the business has come a demand for refinement of product, and as a consequence a great variety of specifications have sprung up covering the use of gravel, most of which have been adapted from those drawn years ago for crushed stone, an essentially different product.

In view of these circumstances it has been the purpose of our association to develop specifications that are especially applicable to the use of sand and gravel. In giving consideration to this subject we have kept in mind three prime factors:

1. The finished work.
2. The natural variation as to sizes occurring in deposits.
3. Economy of production.

Aside from the fact that it should be the desire of every producer to turn out an honest product it is good business that the completed job in which his material is used should be of the very best quality. One poor piece of concrete road or a faulty column due to improperly prepared gravel will tend to discredit the use of gravel. Every producer, therefore, owes it to himself, as well as to his fellow-producer, to keep his products to the highest standard in order that sand and gravel may hold their place along with other aggregates.

We all know that there is a great variation in the same and in different deposits as to the maximum and minimum as well as intermediate sizes. Until recently there was a growing tendency among engineers to make the deposits conform to their preconceived notions as to grading rather than to follow the logical course and draft specification to fit the most available material.

As a result of our agitation of the subject the American Society for Testing Materials has adopted as a tentative standard a series of sizes which we suggested, any one of which is recommended as being suitable for concrete road work subject to such adjustment of sand, cement and water content as may be necessary to make a standard finished product. We have had the hearty co-operation of the U. S. Bureau of Public Roads in establishing this schedule of sizes, and no doubt it will be adopted as a part of the typical specifications for gravel concrete roads which that bureau, at our solicitation, is now drafting.

We are also in close touch with the National Research Council which has in course of preparation a standard specification for all forms of concrete work. This council has unlimited financial resources at its command and is making a thorough theoretical and practical study of the subject.

Based on tests recently completed at Purdue University, we also expect to secure a more liberal specification for tolerance; that is, the percentage of material above the maximum or below the minimum sizes; also, we hope to see fewer restrictions being imposed on the percentage of intermediate sizes.

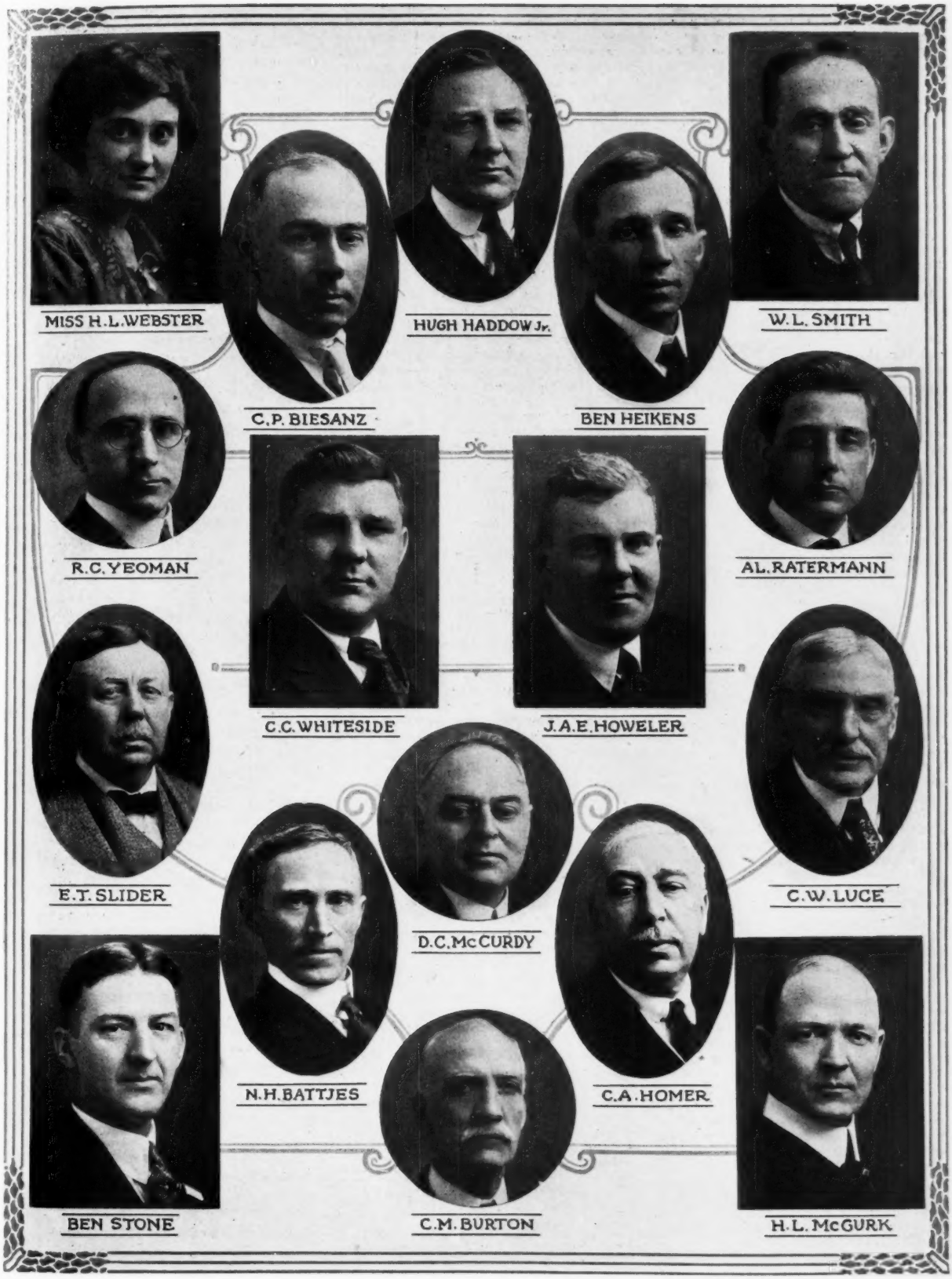
The value to the producer of this greater liberality in specification will show itself in the reduced cost of production, and furthermore, in that a greater percentage of his material may be made acceptable for use in all kinds of construction work. It will place him in a better position to compete with other forms of aggregates. There is, of course, a limit beyond which he must not go in this respect, however, for if specifications are too open, too easy to meet, it invites the side of the road or temporary plant. Insistence upon a clean, screened and reasonably well graded aggregate will largely overcome this possible objection.

In general, it will be the determined purpose of our association to see that gravel takes its rightful place along with other aggregates in every gravel-producing territory.

Each producer is interested in this activity of the association for he cannot tell when the sentiment against gravel may invade his state if the unwarranted prejudice developed in some quarters is allowed to go unchallenged. Then, too, aside from the direct benefits to be derived by the development of proper specifications covering the use of our products we are getting a vast number of competent engineers of national reputation thinking and talking in terms of sand and gravel. This, in my opinion, is the most effective advertising medium we could command.

Membership

In my report to the convention last year I made mention of the obvious fact that the most effective method for arousing interest in the activities of the association was by coming in personal contact with the producers. During the latter



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Sand and gravel men from all corners of the country

part of this year we have had the opportunity to try out this plan, and with very successful outcome. Officials of the association attended meetings in the following states in the order named: Ohio, Michigan, Kentucky, Tennessee, (Arkansas), Georgia, (Florida), Alabama, Mississippi, Louisiana, Texas, Oklahoma, Virginia, Maryland, Pennsylvania, (New Jersey, Delaware), West Virginia, Indiana, New York, Massachusetts, Iowa, Nebraska, Kansas and Missouri.

At each of these meetings preliminary steps were taken toward the formation of local associations, while over 50 new members were added to the National Association.

In submitting to you this report covering briefly work of the association for 1920 I take it that it will not be out of place to outline to you some of the plans and aspirations of the association for the year that is before us:

Plans for 1921

1. Just what the car situation will be this year is largely a matter of speculation. If there should be a general revival of business early in the spring, or even later in the season, with a consequent heavy demand for transportation, we may not expect conditions to be greatly different from last year. On the other hand, if industrial stagnation prevails for any length of time there will likely be more cars than orders. One thing is certain, we will never know what the day will bring forth so long as priorities and special privilege in car supply is legalized. We will not ask for ourselves more than we would acord to other shippers, but we are entitled, as a matter of simple justice, to our proportionate share of the available car supply, and for this recognition of our rights we must continue to fight. We have employed Francis B. James, an attorney of Washington, and of national reputation, well versed in traffic matters, to direct us from a legal standpoint in the handling of our transportation problems.

2. The freight rate question is of next importance. We must not lose the ground we have gained toward securing equitable rate adjustments. Whether the matter be regarded as a local or national proposition the National Association can be of great assistance in the solution of the problem.

3. Engineering and scientific societies, as well as Governmental departments, are now giving consideration as never before to the development of economical and practical specifications for the manufacture of all classes of concrete and for the construction of the different types of highways. As previously indicated, we have established working relationships with these various agencies, and it is manifest that we should take proper advantage of the opportunity offered to secure due recognition of the superior and peculiar properties of sand and gravel aggregates for concrete and as road metal.

It is apparent also that we endeavor to open new fields for the use of sand and gravel in anticipation of the time when a greater demand will be desirable.

4. The organization of every sand and gravel producing district in the United States should be encouraged. This is a natural function of the National Association and can easily be carried on in conjunction with our campaign for increased membership which should be vigorously prosecuted.

In addition to the foregoing activities it appears to me that we can profitably devote considerable time and expense this year to the questions of Uniform Cost Accounting, Insurance and the Gathering of Statistics with respect to the industry.

6. State or district associations are essential for handling matters of purely local and intimate character. The National Association has for its purpose the establishment of broad, general principles and the treatment of questions of national scope. There should be no conflict of authority, but on the other hand a means for securing earnest co-operation between the two should be created.

I doubt the advisability of ever making the local association the unit of organization for the National Association. However, I believe it possible to effect a very desirable point of contact through appointments to the Advisory Council. This department of our organization, established this year under the provisions of the constitution, demonstrated its power for helpfulness on several occasions this year. In this respect I would recommend that each state or district association select a producer as a member of the Advisory Council, leaving it to the Executive Committee of the National Association to arrange for the appointment of members from states not organized.

7. In my opinion the matter which should demand our first attention is that of obtaining a revision of the Esch-Cummins Act to the end that the emergency powers now held by the Interstate Commerce Commission shall be abolished. As already stated we have laid the foundation for a vigorous legislative program along this line. We will need the help and influence of every producer in the United States in order that efforts may be successful.

As you know, the office of the association has recently been established at Washington. In taking this step the Executive Committee considered that for several years to come Washington will be the logical place for our headquarters since the national phases of our many problems, including car supply, freight rates, highway specifications and Federal legislation have their origin at the seat of government.

It is proposed to increase the office force and facilities so that we may be equipped to render a greater service to our members.

The outstanding accomplishment of the National Association for the year 1920, as I view it, may be expressed in one word —RECOGNITION. We have impressed the Federal departments and regulatory bodies with the fact that there is a sand and gravel industry; we have obtained marked consideration from the legislative branches of our Government: we have won the respect and support of allied industries; we have interested a greater number of producers with the effectiveness of our association work; we have increased our finances. We have gained Recognition both without and within our industry.

Thus, we have paved the way for prosecuting a more formidable and aggressive program for the ensuing year. Our formative period is past and we stand prepared to face the tasks of the future with strength and confidence.

Good Surplus for 1920 and Big Budget for 1921

The association completed the year 1920 with a safe surplus and assets of more than $12,000. Without increasing the present dues it is expected to have the funds for a $50,000 budget in 1921. Permanent offices have been established in Washington, D. C., and the staff of the association will be increased to take care of many additional duties.

The monthly bulletin of the association it is proposed to put in the hands of an experienced newspaper man as editor and manager, and to make it an effective vehicle for the dissemination of propaganda on the use of sand and gravel among contractors and engineers.

Amendment of Transportation Act

Francis B. James, a transportation attorney of national fame, who has been retained by the association as counsel on transportation matters, attended the convention throughout all the sessions, and delivered an address which went into the entire history of interstate commerce in considerable detail.

Mr. James stated there were excellent grounds for an argument that sand and gravel rates should be relatively low as compared with rates on other commodities, while now as a matter of fact they are relatively high. He explained that many features of the 1920 Transportation Act were very unusual and contrary to the letter and the spirit of previous acts to regulate interstate commerce, and he recommended every effort be made to secure the repeal of those features of the law.

Uniform Cost-Keeping

The subject of uniform cost-keeping was introduced in a paper by A. A. Alles, Jr., secretary of the Fawcus Machine Co., Pittsburgh, Pa., and chairman of the Uniform Cost-Accounting Committee of the National Gear Manufacturers' Association. This paper covered the subject in a general way very completely, both as to the advantages to be gained from the adoption of a uniform cost-keeping system and the principles involved.

Charles L. Ruffin, of Richmond, Va., discussed Mr. Alles' paper with reference to sand and gravel plant operation. Mr. Ruffin's remarks will be printed in a later issue.

The Lady Member

The convention was honored and genuinely entertained by the presence of Miss Hazel Cummins, owner and general manager of the Urbana Sand and Gravel Co., Urbana, Texas. Miss Cummins' informal talk on "The Vicissitudes of a Sand and Gravel Woman" was so full of human interest and so intimate a picture of the business of sand and gravel producing and marketing that a rather full abstract is published elsewhere in this issue.

Miss Cummins proved herself to be a "regular feller" and no one could have listened to her story without having a most sincere admiration for the grit she

Photos exclusively for Rock Products by Caufield and Shook, Louisville, Ky.

Men of allied industries associated with sand and gravel men

has displayed in overcoming obstacles which would have discouraged many a man. As someone put it, she has plenty of the material represented by the association—sand.

Survey of Industry

A survey of the sand and gravel industry east of the Rocky Mountain states, based on a field investigation by the engineers of the U. S. Office of Public Roads, was prepared by Dr. George K. Ladd of the bureau, and presented by Felix D. Hurwitz. This will be given in our issue of February 12 next.

A paper by Dr. W. K. Hatt, director of the laboratory for testing materials at Purdue University, Lafayette, Ind., covered something on the same ground as his paper before the Indiana Association in December; that is, the "intolerance" of arbitrary sand and gravel specifications, based on ideal materials rather than on the ordinary commercial article.

Dr. Hatt offered many good suggestions for the future activities of the association in the matter of producers knowing their own materials best. He said that representatives of the producers should take active part in the establishment of standard specifications for a great variety of sands and gravels for special purposes.

Visit to plant of Ohio Sand Co.; refreshment station

Value of Trade Associations

Leslie C. Smith, secretary of the National Ice Association, gave a most inspiring talk on the value of trade association activities as related to the public welfare. According to him, one of their prime objects should be the enforcement of fair and honorable trade practices, particularly as these applied to dealings with the public.

Entertainment

James M. Settle of the Ohio River Sand Co., Louisville, as chairman of the Committee of Arrangements, provided a most enjoyable program. One night was devoted to a theater party, one afternoon to a visit to Louisville sand and gravel plants, and on the last day an association luncheon was attended by practically all the members.

Experiences of a Lady "Sand and Gravel Man"*

Miss Hazel Cummins, President, Manager and Principal Owner of the Urbana Sand and Gravel Company, Tells How She Learned the Sand and Gravel Game

I WAS THRUST into this thing from force of circumstances. The gravel pit and farm had been more or less a hobby of my father for seven or eight years, and he had given his spare time to that work which was, at that time, a very new departure in Texas, while his main interests were lumber. All of his lumber interests, practically, were wiped out in one night by the storm in Galveston, and he never really overcame that loss. His health broke, and so practically a year before his death he did nothing with the plant or pit. It was left to subordinates; it was given over to men whose interests were purely personal, as far as we could find out, and not for the interests of the company, nor in the development of the company. He realized shortly before his death that something had to be done. He realized that was the main thing he was living for. And I was the logical one, the only one there, to protect the others. My brother was too young.

Miss Hazel Cummins

My mother and I bought out the other stockholders who had an interest in the pit, and I took charge in January, 1917. And I did not know any more about the gravel business, or any business, than a frog does about arithmetic. I had never even been to the pit but once, and that was two weeks before. As to going into an office, all I knew of office work was to go in and ask for a check—sometimes I got it and sometimes I did not. I guess you will understand that. I was starting at the top managing this proposition, when I did not know a thing on earth about the lower rounds, absolutely nothing. I did not even start with an experienced office force. I had no salesman; my father had done all the selling. That, too, was something I knew nothing about.

Troubles Begin

In the beginning the most trouble I had was, I suppose, the attitude of the various employes. They naturally resented my coming in. I was a woman, in the first place, and in the second place I did not know anything. It was bad enough to have a person who did not

*Abstracts from a talk before the annual convention of the National Association of Sand and Gravel Producers, Louisville, Ky., January 13, 1921. The full story will be published in the official bulletin of the Association.

know anything, but to have that person a woman was worse. Finally, the office force began to bring in little details to me, trying to make me feel good, I suppose, make me think I was doing something, but when anything of importance came up I noticed it was never brought to my attention. So I began to take hold of things; I began to make invoices and find out about prices; that was the only way I knew to find out how they got those prices.

Then I began to check up the books, do what I could with those. I did not know the debit from the credit side. They explained to me that I had to have something to offset every entry; I could not see why. I thought if it were done on one side that was sufficient. The last year I have had trained a bookkeeper. She came to me as an office girl and assistant.

How Not to Sell Sand and Gravel

Then I had a great deal of trouble with my salesman. As I said, we had no salesman at the time. In fact, the man who had taken charge of it did not like our system of doing business, and he decided he would not sell anything until he got a system he liked. So at first we did not even know whether we had a system. I guess I did not know anything about system, and I decided to get a new salesman. I did not know enough about gravel and sand to talk about anything then.

We got a man who recommended himself most highly. He started out to get orders. I did not know anything about selling anything; even at a bazar I was not a success. I began looking up things and looking after contracts of different building being done. He came back.

I said: "Well, what did you get?"

"Well, so and so had decided he was not quite ready yet. He will let me know when he is in the market."

I said: "He already has his contract."

"Yes, but he is not ready."

I said: "You had better go back tomorrow."

He said: "I don't want to make myself a nuisance; it would be better not to go at all."

I thought—all right. A contract had been let. I spoke about it. He said, yes, he knew the contractor; he was a personal friend.

I said: "Go get it." He said he would telephone.

I said: "Oh, no; go after it."

He said he did not see any use in spending that money to go down there. "I will talk to him first. There is no use spending that money until I talk to him."

This telephone conversation I will call Smith and Jones, because some of you might know.

"Hello, Mr. Smith, this is Jones; your old friend, Jones." Of course, I did not hear what the other said. "Yes, I understand you have a contract at Orange for a building. How are you getting along?" ("Fine.") "That is good; I am in the gravel business now." "Yes, I have taken charge of the gravel company." I winced at that; I thought I was in charge, but I kept still. "When you are ready to figure on your material for that I hope you will give me a chance at it for old times' sake."

He went on and asked about his wife, children, family, and things of that kind. "Well, let me hear from you when you are ready for material. Goodbye."

Now, gentlemen, how many orders would you get that way? As little as I knew, I knew that was not getting anywhere. Needless to say, we never heard any more from that order. I then sent him out on a trip through what we considered our territory. During the time we were putting in our system that territory had been let alone. He was gone two weeks. I received most voluminous letters all the time telling how favorably inclined to our material this place was, not ready at that place; they would let us know at the other; another place they had already made arrangements for material. He came back in two weeks with one order for two cars of gravel not signed, and had given a gentleman who sold it for him a commission of *25 cents a yard.*

Another Kind of Undesirable Salesmanship

Now after that I got another salesman. I decided that was a kind of last straw. My new salesman was a little over-enthusiastic. He got orders.

He would go out and get them; the other fellow did not get a look-in. He did not know anything about costs. At the beginning I gave him some instructions about prices, but left it to him.

We sold material; believe me, we got into the market with both feet. I have just gotten out of one contract now, and that is three years ago.

Takes a Hand Herself

I was more or less forced to get into the business as a salesman. I began in a very small way, and was more or less confused at first.

After finally getting the salesmanship proposition more or less settled, I had to go out and see that we got out the stuff. That was another proposition. I went out to the pit. They were sending in orders to me for things of all kinds. I had a very peculiar experience; they sent for a certain kind of packing. I did not know whether it came in a box, or by the pound, or carload. I sent for it just the same. I did not know where to buy it. They wanted spare parts, but what they were to be used for, what capacity or why, I did not know. I did not know the difference between an engine and a pump, except a gasoline engine; as far as the other part was concerned, I knew absolutely nothing. I could run an automobile; that was the limit of my mechanical ability.

I went out to the pit to see what was the trouble when we had orders for which we could not get out the material. When we did not have orders we ran fine. Just as sure as I took an order for prompt delivery, the pump would not work, something was the matter with the shaft, what shaft I did not know, but some shaft. After that, they would have trouble with the pump; it needed a new part, or it would get off the track. It did not seem to make any difference; all on earth I needed to make something happen was to get an order for prompt delivery. If we did not have an order, or just enough to keep going, nothing ever happened. Why, I do not know; we still have more or less trouble of that kind.

A Bad Operating Contract

The superintendent in charge of the pit received 30 per cent of the gross sales for keeping up the pit, operating it, paying the gross expenses. I believe he was not to put in any new machinery, anything of that kind. The consequence was that his salary and cost were very great. So I began going out there from time to time to inspect, and that was resented. They resented my questions, resented anything I had to say. I found out that the only thing I could do was to get someone in charge who realized that it was necessary to get out the stuff, or would realize I had more or less to do with it, and a skilled man on the pump. At that time we did not have any skilled men. The man in charge was picking up anyone he could get.

They look at me a little differently from what they do a superintendent. By the day laborers I was considered as a joke; I guess I was. Everything went wrong, and I decided the only thing I could do was to get a new superintendent. I let this man go; there was some difficulty in getting out of the contract; I hate contracts. In three months I made three changes; maybe for the better, I don't know. The last man I let go when I finally got the man I have now. He has practically rebuilt the whole plant; he has helped to increase our output practically 200 per cent and keeps things running. But when I put him in charge, the man who was there, I sent word to him that his position was still there—not as superintendent, but in charge of the engine or pump he had before I made him superintendent—I was glad to have him stay.

He came up to the office all bristling, saying he would have to leave, he could not be demoted. We were making a change; we were trying to get water from one pump; we had to get it from a lake

or pond, through a certain canal, and that was stopped up. We decided to move down about 75 yards and put in a new canal there, and let the water go into a pond over there. He said I was going to ruin my pit. I wanted to know why. He said, "Well, you are changing the course of the water." I said, that is true, but this is all one pond; the water will all go through, whether it comes in this side of the pond or the other side of the pond. He said, "That is all right; theoretically, it will do it; practically, it never will." That is the ignorance I had to deal with—water would not even seek its own level; so I was not the only one who did not know anything.

Becomes a Real "Sand and Gravel Man"

It was along about this time that I was having so much trouble.

You know when a man gets real mad what he does. A woman generally weeps; I took the man's prerogative; not from desire, but from necessity. Well, during all of these changes, that is three years ago, those are things I met up with inside of four walls; we do not tell our troubles outside, but I am doing it now. We began then to make our changes, and I stayed down at the plant most of the time.

I finally found out I could not live in Houston and get up to the plant, 60 miles away, in time to know what was going on. I found when I went to the pit something went wrong in the office. I found when I stayed at the office, something went wrong at the farm or pit; and as I was just one person I decided the best thing to do was to go right out there to the source of supply and close up the Houston office and close up the local yard. So I moved to Urbana and am still living in a three-room house. We hope after a bit to build a new one.

I have been living there three years and only get to go to Houston occasionally. I am asked how I can stand it, but you who have been there know that when your bread and butter absolutely depend on it you can stand most anything. It was at stake in my case. Now it is not bread and butter; it is cake. The long and short of it is, I had to learn everything from bookkeeping to selling and buying; I had to get into it all.

That was not all the trouble that I had; there were some troubles on the outside. I had trouble with contractors; they did not like to deal with a woman; women did not know anything. I had trouble to get people to whom I was trying to sell my material to realize that it was a little different from the majority of the material in that country, or in any part of the country. The business had been worked up by my father. My father could have sold ice up at the North Pole. I was not related to him when it came to that. I had to work.

Finally, I did manage to get the confidence of the contractors, the confidence of the purchasing agents and different ones; so that was not so bad. Even now, the telephone will ring, and someone asks for the general manager. I will go to the 'phone and "Hello—I asked for the general manager." Well, I was there. Sometimes they would hum and haw, and try to jolly me a little bit, but when it came to trading, they put on their trading clothes.

Financing the Operation

I had trouble with the bank. Mr. Johnston made the statement yesterday that you could not do anything without real money. We don't have much of anything if we don't have real money, and to have real money we have to get the confidence of the banks. That was the hardest thing I had to do. As a company, the officers of the organization had no trouble whatever to make a loan to carry them over a little hard spell. When I was teaching school at $100 a month, I could borrow more money at the banks than as general manager of the sand company. I found my credit was better as a teacher than it was as a business woman.

That is not so now. It took them three years to realize that. I had to leave Houston and go to the small country banks; they knew what I had; they gave me the once over and decided they would let me have the money, and I have never had to ask anyone on the outside since. They have carried me through everything I had to have, and I think the confidence has not been misplaced. It is a one-man bank. (Applause and laughter.) I did not have that in my speech; I don't know why I said it.

Those were the main difficulties I went through with. Since then, of course, I have had what troubles everybody else has had; maybe a few more, I don't know.

Business in Spite of Freight Rates and Car Shortage

You people talk about freight rates up here. You don't know what freight rates are until you get down to my part of the country, where a 60-mile haul is about the shortest you have. Some of my hauls are as much as 250 or 300 miles; when the freight rate itself is three times the value of the material, you have to go some to sell it. This last freight-rate increase has done a great deal to suspend construction work in that part of the country. I don't know just what it will amount to in the end. They have enough road work down there to keep every pit in Texas going for the next 10 years, but they are holding off until something is done with freight rates. I don't know what will be done.

This proposition of whether we will have three miles of good road, or whether we will have 10 miles of poor road; whether it will be roads that will last and be worth putting up the money and the bonds for, or whether it will be a road that by the time they have finished paying the bonds will be gone and past history and they will wonder where the road is, is a question.

Freight rates are things we are worrying about more than anything else there. The car shortage has affected us, but not like the freight rates. I have changed my market more or less from the southeastern part of the state and gone north. People down around Houston are a little bit like my over-enthusiastic salesman. I made up my mind if I had to sell on a losing proposition, I would shut down. I was not running to give men employment particularly; I was not running to see that men got material for a certain building; it was for bread and butter, and cake, and I wanted some cake thrown in; and I simply made up my mind that if that thing kept on, if I had to cut prices to get orders, I would quit; and I have never quit.

Long-Haul Business

So we began going up north instead of going south a 60-mile haul I shipped all the way from 200 to 300 miles, and I am getting my price. I worked out my price. I have not worked out my cost accounting as you gentlemen have done on a very detailed proposition. I don't know just what my screening costs are; I don't just know my pumping costs, or any one thing, but I know what it all costs, and I know we have cut every place we possibly could and get across; I know the meaning of efficiency.

All last year when we had this car situation, we worked at maximum cost and minimum sales, as the result of the car shortage, and I made my price accordingly. When they came to get material, it was take it or leave it. They generally took it. Of course, those days are over; whether we will be able to get as much cake as we did, I don't know, but with the few lean months we had, I managed to get by very well; then when things began to look up, I did better.

I also decided that I would not take any large orders, not an order that it would take me over six weeks or two months to fill. How did I know but that at the end of that two months I might be getting five cars a month instead of 50 or 60. If I could only get five cars a month, I would make my prices accordingly. That was the way I worked it. Perhaps that would not have done if I had a great deal of competition. Everybody wanted material and was willing to do anything to get it. Why should we material men be the goat? That seems to be the proposition, that we are the ones to suffer.

Wouldn't Be the Goat

I had some oil people down there. We

fuel oil, internal combustion engines; they increased their price from $2.90 to $4 a barrel. I increased my price for gravel 25 cents a yard. A certain oil company telephoned me one day for some material; they had finished what they had. I gave the people my price; if I had been a man I would have heard a plenty; I heard a plenty as it was. The talk went on.

He said: "We have contemplated finishing this work on such and such a price; that was the price you gave us."

I said: "Yes, I gave it to you on a certain number of cars."

He said: "How did it come to go up?"

I said: "That is not very much increase; you people have increased me over 100 per cent on oil. I do not see any difference in you increasing your oil 100 per cent and my increasing my price on gravel; I have only increased my price about 15 per cent."

That is the proposition we have to deal with every time we raise prices. It was terrible when I raised; when they raised, it was all right. The only remedy I can see is for the gravel people to get together; we are not together. I will decrease my price with the decrease in cost of production. When the price of oil goes down, and labor goes down, my price will go down.

In refusing to cut and take larger orders, I found I got the cream of all the business. Others would tie themselves up with big contracts and could not take the other orders that came in. I found it paid to be the little man under those conditions.

Speeding Up Production

Year before last my car supply was doing pretty well; I had a couple of Government contracts, but I had trouble with the man in charge—not shirking, perhaps—but if there were a breakdown there was too much delay. If repairs were to be made, there were too many times those repairs could be made temporarily, and there was too much letting things go. I decided I could work out what I considered was a legitimate profit on our investment; what it would cost us to run, then how much we had to sell to make that up.

Over and above that amount, I paid a bonus, everybody got a bonus. We never spend any time in getting things going. If anything broke, it was patched up until we could get a new piece and put it in, but everybody went to work. If a car was pretty near loaded at six o'clock, if it was half loaded; "let's finish it," and it was finished and brought out. I think we have increased our production 15 per cent by the bonus system. Last year we could not use that system because of the shortage of cars. I expect to use that system as soon as I find the shortage of cars is over.

How to Get Cars

My troubles with the car situation were about the same you people had, perhaps not quite so bad in some instances, as I have been told. However, if the car situation was relieved, we would still not get cars enough. I went to the Car Distribution Department. I was told I was getting my *pro rata*. If I ever hear that word again, I hope something will happen.

I said: "That is all you can promise me, is it?"

"Absolutely."

I said: "Then, I cannot run."

"We don't want you to shut down."

I said: "All right, I am not begging for any favors, I am asking for cars. When you get ready to give me a sufficient number of cars so I can operate and make something out of it, I will continue."

"I will see what I can do."

I left his office and went to the next man higher up. He called up the same man I had been talking to and brought him in. They decided to increase my pro rata about 20 per cent. The next man promised about 50 per cent.

I went out and went to the president of the road. I asked him what was the matter.

I said: "They give me half a dozen reasons why we are not getting cars; tell me, am I getting my pro rata; my pro rata seems to be a movable proposition. What is it?"

He said: "There is no pro rata, there are plenty of cars."

He rang up someone; I did not see who he was, and said he wanted to know why I was not getting plenty of cars. They gave him the same pro rata stuff. I wish you could have seen his face. I have not heard any more about pro rata in getting cars.

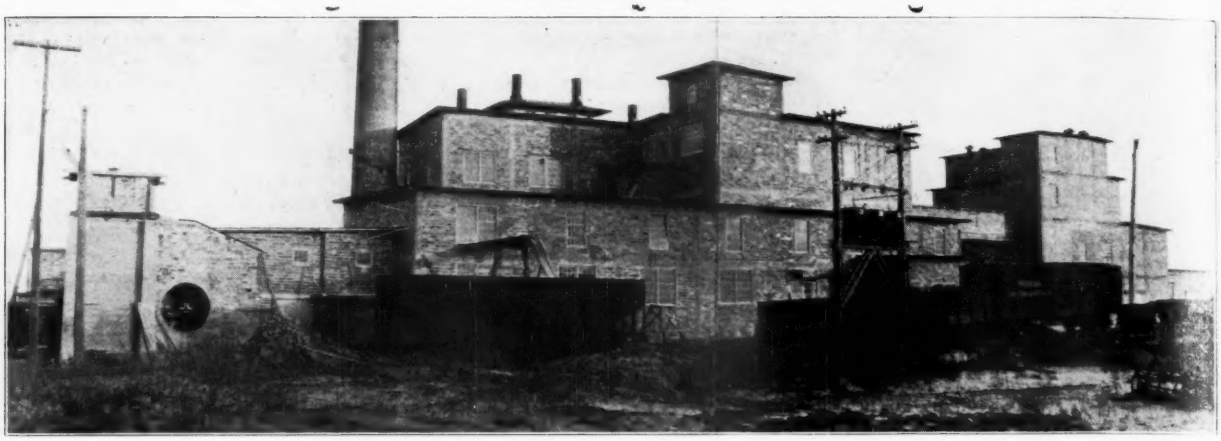
Bright Outlook for Building Material Industry

WHILE THE first half of January has brought only a few notable instances of improvement, it has certainly given evidence of a more hopeful feeling than has been shown during the past two or three months, says a recent statement issued by Tomkin Brothers, building material dealers of New York City, Newark and Philadelphia. In certain lines of merchandise the downward trend has brought prices to a point of stability at which trading can be done with a greater feeling of security. A spirit of optimism prevails and good business is looked for in nearly all lines of merchandise throughout the balance of the year beginning with the Spring months. Spring is set as the time for the beginning of a marked improvement in business.

The building industry has always led the way in recovering from business depression. Statistics show that the difference beween good and bad times can be measured largely by the amount of construction work going on, and one of the most important factors in the situation today is the vast amount of such work which ought to go ahead at the earliest possible moment. Very little of the deficit in construction work incurred during the war has been made good these last two years because what little work has been done is scarcely enough to meet the requirements of the country's normal growth. The way in which the country has discounted the rather sudden shrinkige in values during these last few months shows that our financial structure is thoroughly sound. Bankers say that there will be plenty of credit for all conservative construction projects.

Regardless of the unusually fine weather which has prevailed so far this winter, and which would under ordinary circumstances tend to promote the use of cement, shipments of this material have been at a very low ebb. The reason is not difficult to see. In December, there was a slight reduction in price and ever since that time there have been rumors that another decline would take place during the winter. Naturally, dealers and contractors have been holding off, waiting for this expected drop. As Portland cement is one of the basic materials upon which much construction depends, a substantial decrease in price might act as a stimulus for a great amount of work to proceed. There is a vast amount of public work which has been deferred, waiting for more normal building conditions. It is estimated that municipal work takes about five per cent of all the cement manufactured. A considerable amount of this class of work is scheduled to go ahead this year. There are hundreds of miles of road work also waiting to go ahead. The manufacturers feel confident that they will have all they can do to supply the demand this year, and cement will probably not be as plentiful and as easy to obtain as many dealers at present seem to think.

In the lime department, which has been one of the most rigid of all the building materials during the last six months of price readjustment, the manufacturers and dealers have made substantial reductions. In barrelled products, such as finishing and common lime, the 40 per cent cut effective this week represents a 30 per cent reduction by the manufacturer and a 10 per cent cut by most dealers. In hydrated lime, both common and finishing, the manufacturer has taken off a dollar a ton and so has the dealer for an equal amount.



New plaster mill of the Wasem Plaster Co., Ft. Dodge, Iowa

Wasem Plaster Co., Ft. Dodge, Iowa, Has Model Gypsum Plant

Entire Preliminary Crushing Plant and Storage Bin Below Ground Level—Other Details

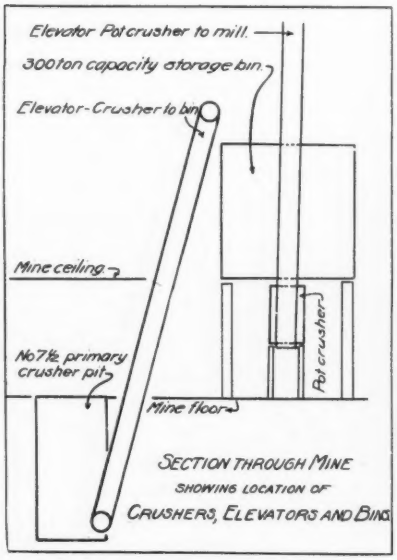
IN 1918 one of the most recent plants in the Ft. Dodge, Iowa, gypsum district was completely destroyed by fire. This was the plant of the Wasem Plaster Co., which had begun the manufacture of gypsum plaster in 1911. During that period a very remarkable demand for its products had been built up throughout the Northwest.

Before the smouldering ruins of the fire in the early part of 1918 had died down, plans were in the making by the officials of the company for a new fireproof plant of the most modern construction. The new mill has now been in operation for two months. The new structure is of brick and reinforced concrete.

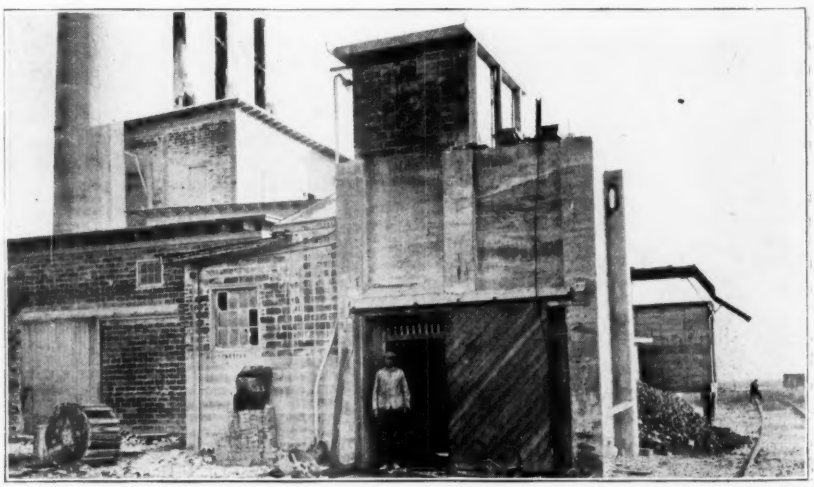
The Wasem Plaster Co. is profiting by the years of experience in the operation of the old mill by arranging and equipping the new mill to be very compact. The plant is equipped with electric power and motor drives. The equipment provides for large storage of wall plasters, stucco, ground and crushed gypsum, each storage separate of the other. A novel and interesting feature of the new plant is the placing of the initial and secondary crushers in the mine and substituting two bucket elevators for the usual mine hoisting apparatus.

Plant Details

The property of the Wasem Plaster Co., which lies practically in the center of the Ft. Dodge gypsum industries, consists of 320 acres. The deposit is about 35 ft. below the surface and averages from 24 to 30 ft. in thickness. The material is mined in the usual manner—the pillar and room method being used. The rock is loaded into two-ton cars and drawn by mules to the main line and placed into



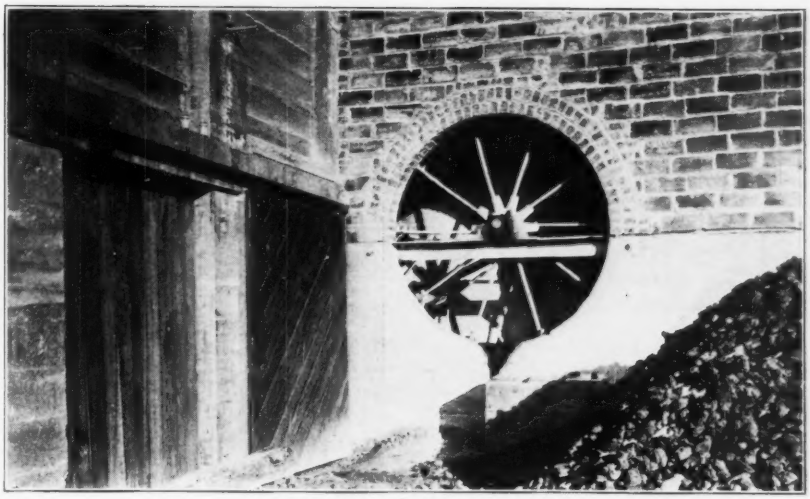
Underground crushing plant



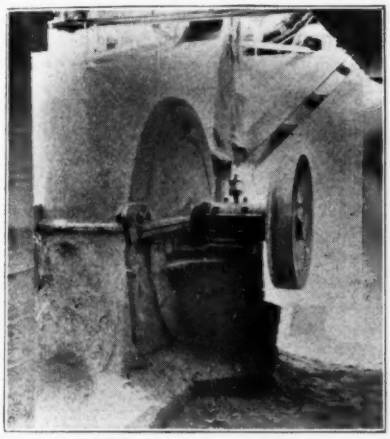
Elevator shaft to mine—Bin and chute at the right for loading out crude gypsum rock

trains to be hauled by electric motors to the crushers, located in the mine directly beneath the mill, where it is first weighed on track scales and then crushed. A No. 7½ gyratory crusher is mounted so that the opening is below the floor of the mine and the rock is dumped into it from side-dump cars. The crusher reduces the material to below 2 in. in size.

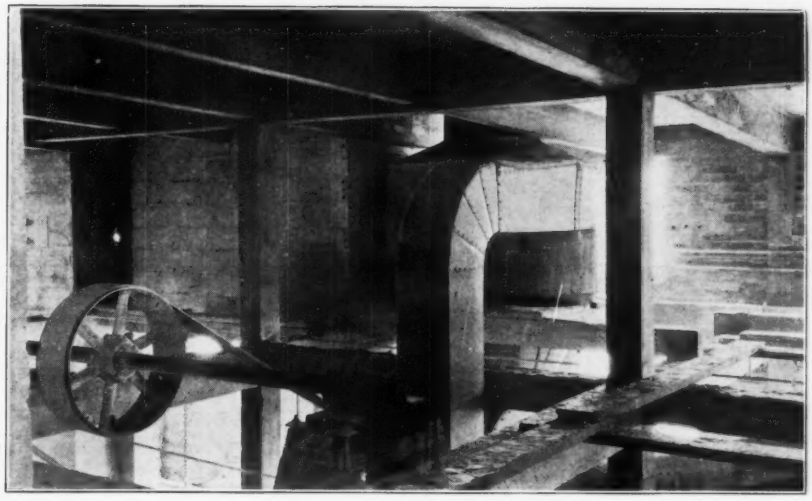
A bucket elevator 100 ft. high elevates the crushed gypsum rock to the underground supply bin with a pot crusher directly beneath so that the material feeds into it by gravity. This supply bin is used as an emergency reserve so that in the event of a break-down in the mine the mill will continue to operate. The pot crusher further reduces the rock to ½-in. size down. This crusher discharges to a 75-ft. bucket elevator which conveys



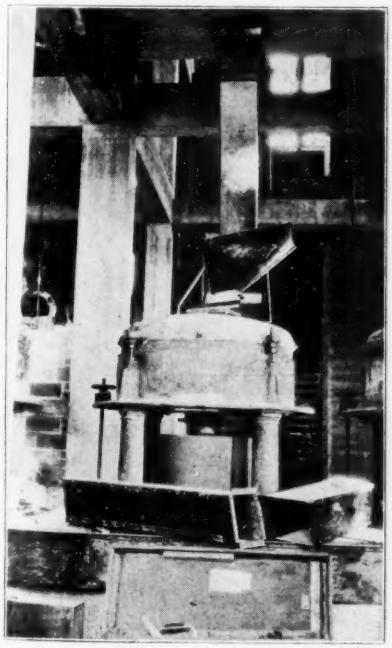
Fan for ventilating the mine



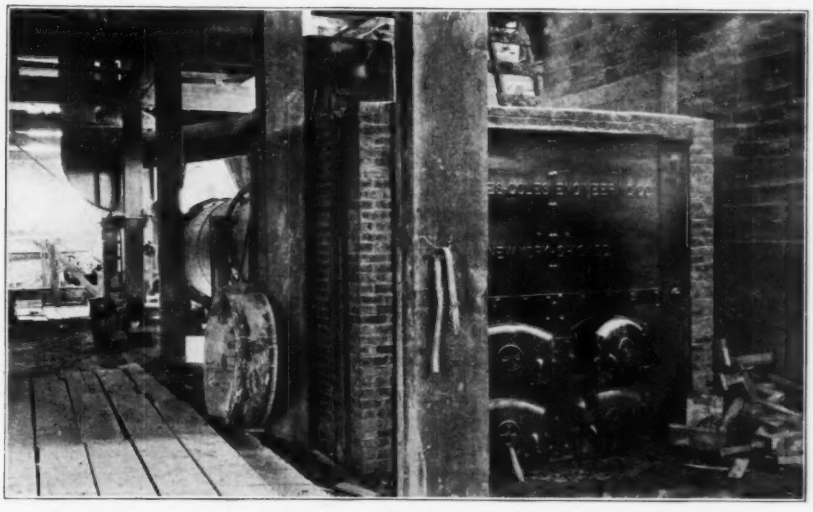
Williams mill following dryer



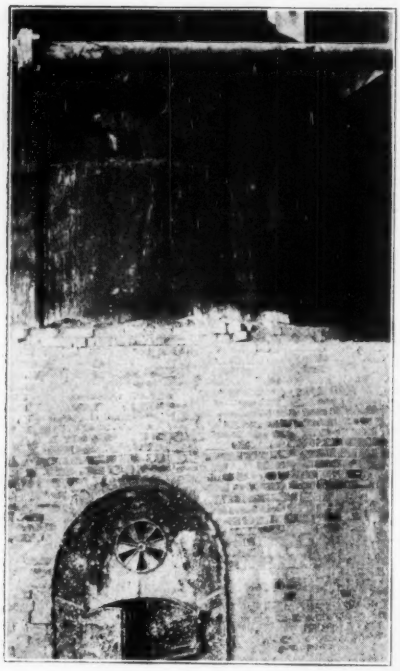
Draft exhaust on rock dryer



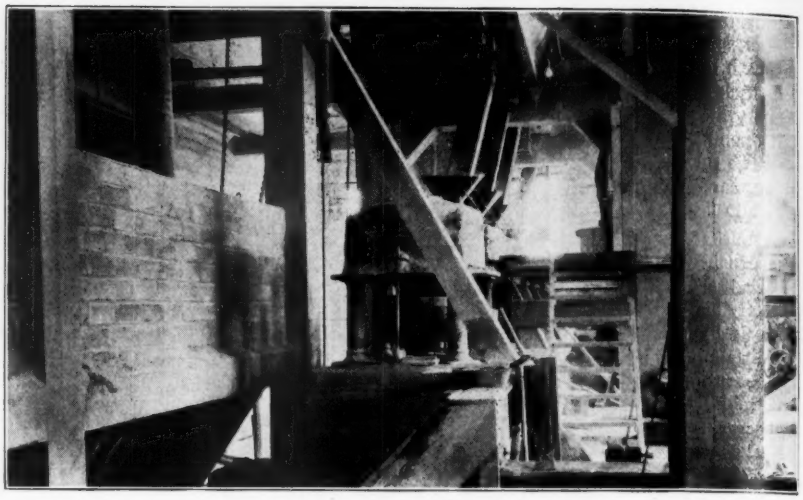
Buhr mill for raw rock



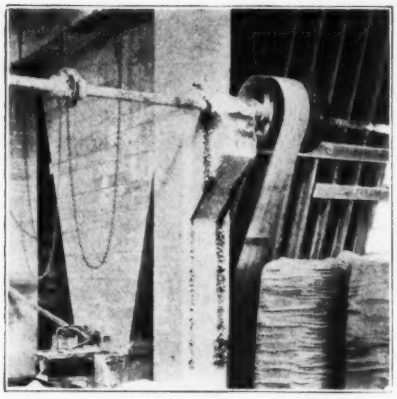
Double-tube dryer; draft returns between inner and outer shell of dryer



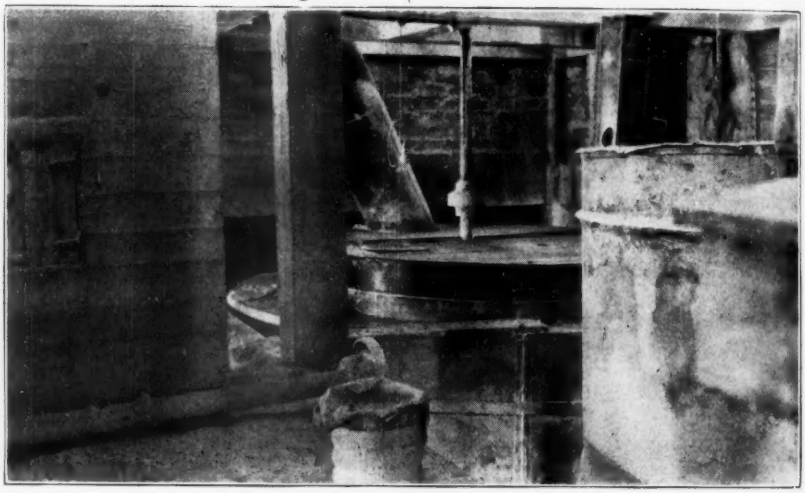
Calcining kettle under construction



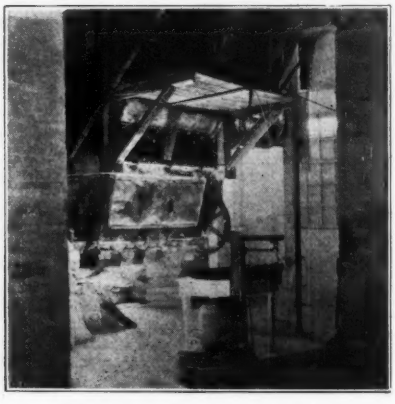
Battery of Buhr mills preceding kettles



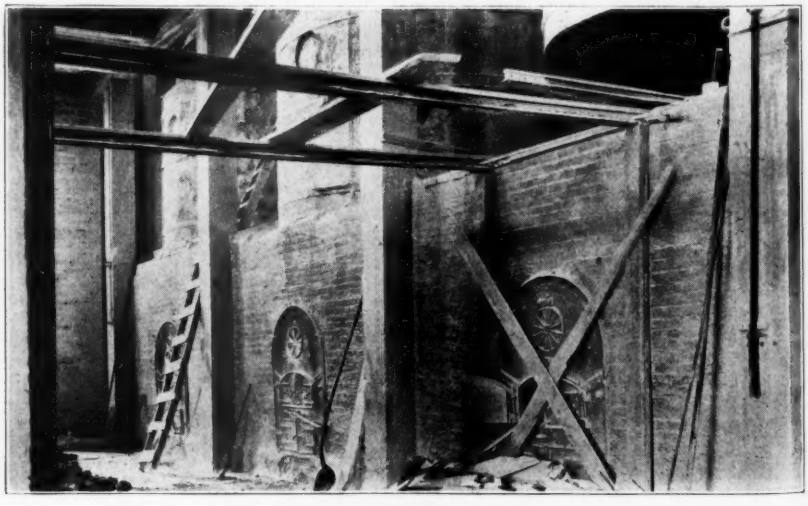
Bin for finished plaster



Top view of calcining kettle



Mixing and bagging machine



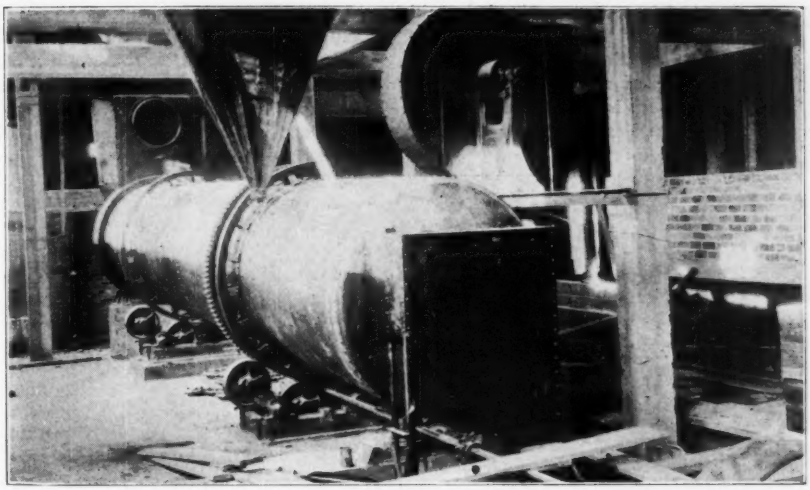
Battery of four 15-ton kettles

the gypsum rock to the mill proper where it may either be conveyed to cars to be shipped to cement mills or chuted to the dryer department of the mill. The mounting of the crushers on solid bed rock prevents any vibration loss and does away with heavy, expensive footings if mounted in the ordinary way in the mill superstructure.

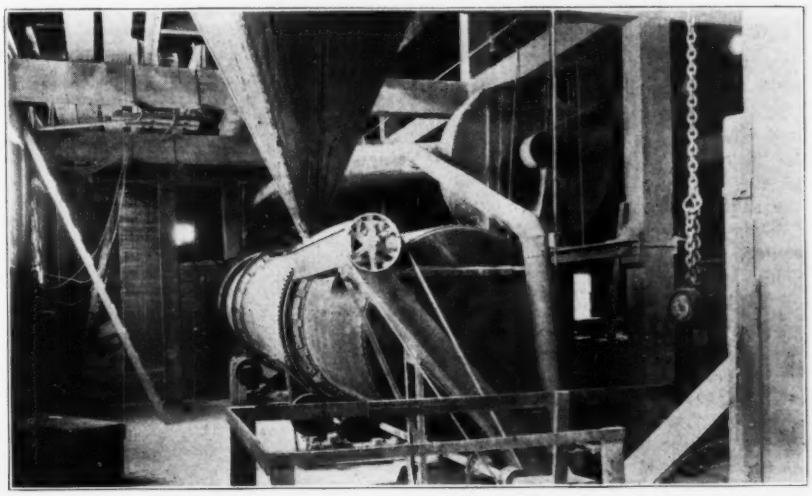
In placing the large crushers in the mine they were lowered down the shaft, part by part, and assembled. Provision has been made around the underground settings for ample room for adjustment and future repairs. A motor-driven elevator is supplied for handling supplies and lowering the miners to the mine. The officials of the company state that the steady full capacity production of the mill is assured by the bucket elevator from the mine and the large storage bin preceding the pot crusher. This will do away with the intermittent operation where rock is delivered by hoisting the loaded mine cars to the surface.

The steel bucket elevator from the mine discharges the material into a special 40-ft. coke-burning dryer. (Coke is used in drying the gypsum because coal would color the product). The construction view included shows the dryer in place and a hopper provided at the discharge and to chute the dried material by gravity to a hammer mill pulverizer which is mounted in a part below the dryer.

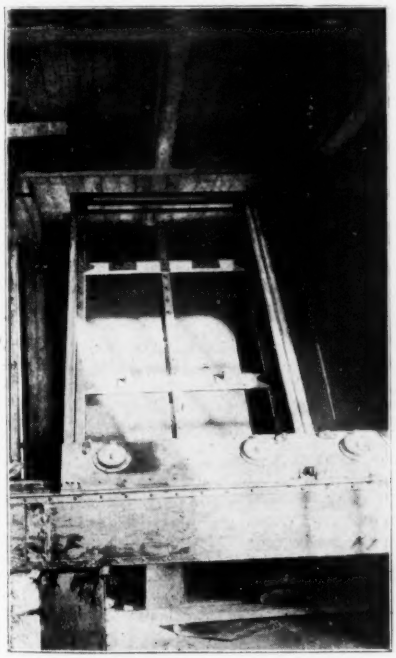
The pulverized gypsum is then elevated to Newaygo vibrating screens which are shaft driven from one motor. The material passing the required fineness of a 100-mesh screen is conveyed direct to the mills or the kettle feeding bins and the



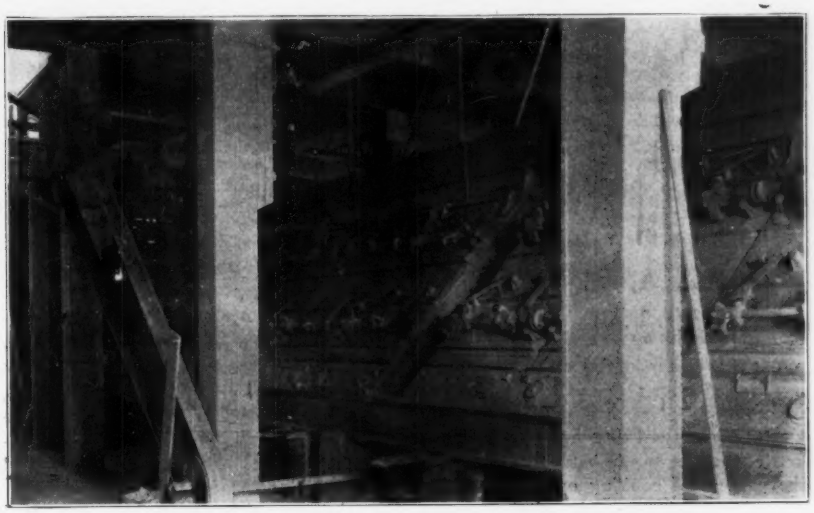
Dryer during erection—discharge end in foreground



Completed dryer showing device for feeding dry bin rock to mill



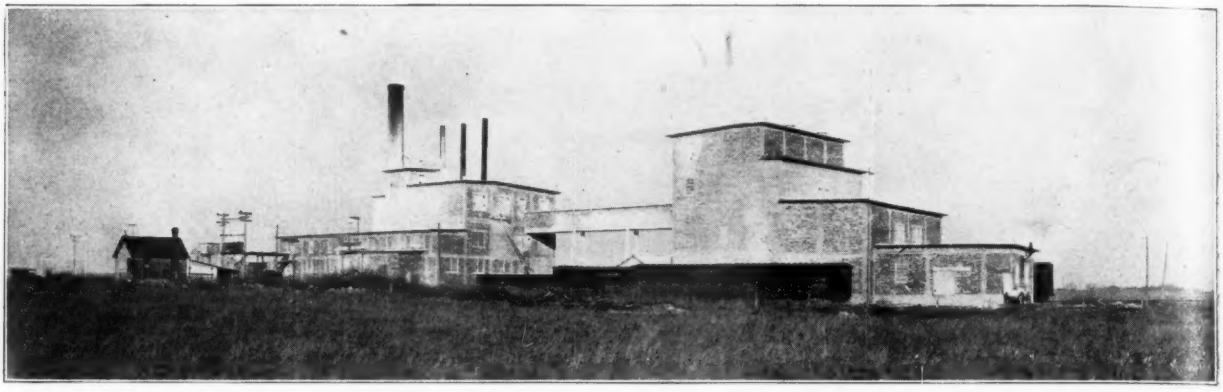
Newago screen with cover removed



Battery of screens for dry gypsum rock preceding kettles

coarse material is sent to the buhr-mill supply bins, which feed by gravity to a battery of buhr mills.

The purpose of the Cyclone, located above the dryer, is to recover all fine ground gypsum drawn out by the fan.



General view of the new plant of the Wasem Plaster Co.

It can be seen from the photograph that after the cyclone draws the air through the dryer it discharges into this cyclone and whatever fine gypsum is drawn out by the fan is saved by this cyclone. The air discharges perpendicularly out through the roof and the fine material recovered discharges into the screw conveyor mentioned, which conveys the material back to the hammer mill under the dryer. The material, after going through the screens above, does not return to the hammer mill, but whatever material is not ground fine enough to go through the screens is returned to the buhrs for further grinding. After going through the buhrs it goes into the same elevator that also handles the material after coming through the hammer mill and back on to the screens again, continuing in this manner.

The kettle-supply bin may be used either as a reserve for the kettles or the material may be sold in this form for agricultural gypsum. Before this material can get to the kettle bins any material not reduced sufficiently to pass through the screens is returned to these buhr mills, where it is further reduced and then is sent to the screens again, as all gypsum rock must be reduced to approximately 100 per cent through 100-mesh before it is delivered to the kettles or the kettle supply bins. The policy is to do all the grinding before calcining, for it is stated a more uniform product is obtainable by so doing.

There are four kettles of 15-tons capacity each. This gives an output of 900 tons of finished plaster in 24 hours' run. The finely ground gypsum is put into the kettle from the top in batches, and during the process of cooking out of the water it is mechanically agitated by rotary arms. Heat from a coal fire is applied under the kettles. It requires about 30 minutes to fill a kettle and takes from 2 to 2½ hours to drive off a sufficient amount of the water of crystallization required for all of the work.

The finished product discharges to the hot-pit bins. The material is elevated automatically from these pit bins to a screw conveyor, where it is conveyed to and deposited in four concrete hopper-bottom supply bins in the warehouse, where they are mounted on the third floor. These supply bins feed by gravity to four smaller bins, from which the material is fed into the mixers. As the material is fed into the mixers certain amounts of retarder and hair are added. Immediately below each mixer is a packing machine which will handle the products of the mixer. The material is packed in either 80-lb. paper bags or 100-lb. jute bags. The arrangement of the supply bins, mixer bins, and packing machines is unusual in that one is fed from one to the other by gravity.

The Wasem Plaster Co. was originally incorporated by Adam Wasem, but upon his retirement from active management in 1909 his sons were included in the incorporation. The designing and supervising of the construction of the mill has been entirely under the supervision of the company officials. Adam F. Wasem is president; William A. Wasem is vice-president; Henry M. Wasem is secretary, and Otto E. Wasem is secretary and manager.

Lime Association's Recommended Tariffs on Lime

THE FIGHT being made by lime manufacturers in the United States to protect themselves from Canadian competition was summed up in a brief recently submitted by George B. Wood, president of the Rockland-Rockport Lime Corp., Rockland, Me., at a hearing befor the House Committee on Ways and Means. Mr. Wood, representing the National Lime Association, recommended the following maximum duties:

On quicklime in cooperage, 50 cents per 100 pounds.

On quicklime in bulk, 30 cents per 100 pounds.

On hydrated lime, 40 cents per 100 pounds.

On limestone (pulverized), $1 per short ton in bulk, $1.50 per ton in bags.

In view of the fact that the exchange rate may change rather rapidly, it was suggested that the duties might be readjusted yearly on a fixed date, based upon the change in the exchange rate. Accepting the 50-cent duty on lime in package on the basis of 15 cents exchange rate, that duty could be reduced to 35 cents when the exchange rate was at par, and correspondingly increased should the difference become greater.

Mr. Wood opened his testimony by giving the Committee a brief outline of the lime industry, during which he said:

The lime business itself is divided into three important classifications: First of all, the one most commonly known, of lime for building construction work; secondly, lime is a basic and most important chemical reagent used by something like 140 different manufacturing industries in their chemical processes. On that basis it was given a preference by the War Industries Board during the war, by reason of its necessity in the manufacture of a great many important commodities in this country. Its third important use and the one that is growing the most rapidly is its use in agriculture. My particular company manufactures and ships, in a normal year, approximately 100,000 tons, or, put into terms of barrels, a million barrels of lime sold for building construction, for agricultural purposes, and for these industrial uses.

The paper mills of the States of Maine, New Hampshire, and Vermont use annually in excess of 75,000 tons of lime. The high-calcium lime for soda pulp and sulphate pulp manufacture is shipped principally from Maine. The magnesian lime for sulphite pulp manufacture is shipped principally by the Lee Lime Co., with plant at Lee, Mass. The lime for bleach purposes comes principally from manufacturers in Vermont, Massachusetts and New York, who are adversely affected by Canadian competition.

Stability and Price Tendencies of the Limestone Industry

An Interview With One of America's Foremost Limestone Quarry Operators—A Producer of Ballast, Road Stone, Blast Furnace Flux and Agricultural Limestone

THE VERY GREAT PRESSURE being brought to bear from all sides to force down the price of quarry products should not be yielded to except the quarry operator is himself thoroughly convinced that he can reduce his costs accordingly. For there is a fundamental difference between quarry products and other commodities which have paid their producers or manufacturers unheard of profits during the war and since.

During the war, quarries and gravel pits were not allowed to operate, generally speaking, by government order, and since the war their operations have been restricted beyond all right or reason or expectation by similar drastic government orders. Consequently, while other industries were paying big dividends and piling up huge surpluses, *these industries* were struggling to make both ends meet and prevent piling up big deficits.

Remember also, that the quarry industry was doing this not for *lack of actual demand,* but to meet an artificially restricted production. The prices of these commodities, generally speaking, never responded to the *enormous potential demand,* because unnatural conditions were created to stem this demand at the source.

Consequently, conditions in the quarry industry are fundamentally different from conditions in the automobile industry, for example, where an enormous demand was met and filled at high prices and with large profits. The automobile industry, and a great many others, are now attempting to readjust conditions of over-production to an abnormally decreased demand, while in the quarry industry there has actually been an underproduction and there is and will be *an increasing demand.* What, then, in the quarry industry is there to *readjust,* which cry is now heard on all sides?

This question is fully and accurately discussed in an interview with one of the largest and most progressive limestone quarry men in the Middle West, whose modesty and the intimate manner in which he goes into the subject forbid the use of his name. He said:

Demand Is There Now

"The American people want good roads so badly that they are going to have them, and have them now, this year, next year and after next year. A man with a pleasure automobile wants good roads as badly as the little boy wanted ice when he got his first new pair of skates. Then, there is the economic side of creating easier and cheaper access to the necessities of life produced on the farm and elsewhere, and the amount of gasoline wasted in traveling over bad roads is still another argument for them. The point of complete saturation in automobile consumption is placed ahead with every new highway and township road constructed, so that the automobile producer, the steel maker, and blast furnace man; in fact, everybody wants good roads, and until the country's demand for good roads, more houses and better railroad facilities are reasonably well met and brought down to a closer relationship with its other needs, you cannot bring about a well-balanced condition in industry, particularly with respect to wages paid for labor in all parts of the country.

"The Bureau of Public Roads, Washington, D. C., reports that there have been recently voted $540,000,000 of state highway bonds and $360,000,000 of county highway bonds in the whole country, and this $900,000,000 will be available for road building this year. The amount of railroad work needing to be done is far in excess of that amount. Then, there is the need for house building and a great variety of construction work.

"Now, there is over six billion dollars of cash in circulation (nearly $60 per capita), which supports the belief that much of this construction work will go ahead.

"The manner in which the country has borne the great shrinkage of values, and the comparatively few important failures, has shown that the business structure is essentially sound. The banks have carried the situation through a great strain. There will be plenty of credit for the revival of business emanating from a fundamentally sound basis. The business organization is in working order, and ready to resume normal operations when conditions are right.

Long Waited-For Chance of the Stone Industry

"There is no set of producers of a basic commodity entering the year 1921 with greater hope of elevating their industry out of this period of depression than those engaged in crushing limestone.

"The non-profiteering nature of the business supplies a firm foundation on which to stand in the process of the readjustment of industry. To convert an industry to a perfect state of readjustment, every ounce of profiteering must be squeezed out. Inventories must be reduced to replacement values of 1921. The inefficiency of labor must be eliminated, and costs must be built on these reduced values of raw materials, and a careful estimate made of what the labor cost will be over the period of the sale-price commitment, and to this a margin of profit must be added that all fair-minded people will consider just and right.

"If you have adjusted your business to meet these specifications, you have gone as far as you can toward relieving a depressed industrial condition, and we believe you will admit that if the crushed stone producer will do the same he has done as much as could be justly asked of him.

"The first requirement—that of squeezing out the profiteering—is easy, for there never has been an ounce of profiteering in the business.

"Inventories, such as a stone producer carries, are so small that reproductive values will have no appreciable effect on the total costs.

"The cost of fuel, including coal, gasoline and electricity, will be very little less in 1921 than it was last year. The electric power purchased will be no less, and we do not look for much reduction in gasoline (but this is a small item with us). Coal may be contracted at a slightly lower figure than last year after our present contract expires April 1st next, but the extreme condition could not affect the total cost of producing limestone to exceed two cents per ton, and this would cover the entire fuel and power item.

"We are expecting our costs to reflect the elimination of labor inefficiency, and this item will be amply discounted in our estimated costs for the coming year.

"The gain made in the elimination of labor inefficiency and the other slight gains referred to will no more than fill the gap in the modest margin of profit.

"Any producer of crushed limestone who commits himself to prices to run

through the whole year, on the assumption of an appreciable reduction in labor cost, is taking a plain gamble.

"A careful estimate of our wage rate to run through the entire year does not indicate any appreciable reduction, for the reason that we believe while there may be some lowering of wages in our locality during the forepart of the year, there is a strong probability that they will have to be advanced to the present scale a little later, so that after we add a reasonable and modest profit, the final summing up does not indicate a much lower price on crushed limestone for the next twelve months than is now being charged.

"A record of the limestone industry, brought right down to 1921, clearly shows that the incomes of the people engaged in it (from the day laborer up to and including the stockholders) have always been out of balance with the incomes of those engaged in the production of other commodities. Therefore, there has been a gap in the margin of profit which must now be filled.

Readjustment in Other Things Not Parallel Cases

"Shoe makers, textile producers, and others are adjusting to a fair basis of exchange with the present price of farm products, which will stimulate the consumption of these products everywhere, but particularly in the agricultural districts, and will put all of the workers in these lines back into the shops. This will greatly relieve unemployment, but much labor will have to be shifted from automobile and kindred products to the building of good roads and other construction work, the demand for which is now permanently established. If anything like the amount of construction develops that most producers believe will come in 1921, we may more likely find a shortage of construction labor than a surplus.

"From 1914 up to the middle of 1920, the consuming power of our country gradually increased and finally reached a stage where all of the wants of our people could not be supplied because there were not workers or producers enough to furnish all the things wanted.

"There was food and clothing enough, but shelter was short. There were plenty of automobiles, but other essentials for traveling about were short, and good roads were one of the latter.

"We finally reached a point where something must happen. People's minds were all agreed that a drop must come, and everybody was waiting for the gun to be fired, and when the precipitate drop in farm products was forced and we began to realize that the farmers' purchases would be shorter by six to eight billion dollars in 1921 than they were in 1920, we knew we were "on the toboggan."

"During the past two or three years, people have been crowding themselves under inadequate roof space for shelter, have let railroads run down to a point where they were no longer able to give service, and the wagon roads were allowed to deteriorate at an alarming rate. so it was plain to be seen that if no one was forced to consume less, thereby releasing some labor, we would have a collapse in our transportation system, including highways.

"We are able to point to many specific instances in 1920 where contracts for new roads and repairs for old ones could not be let as there was no labor available to do the work; consequently, no bids. The money was there and ready.

"Even the railroads, with their limited means, would have taken much more ballast stone if they could have found labor to put it under the tracks.

"Now we come down to the question of readjusting industry generally, and while we realize that a real balancing of the relationship between commodities must be brought about, we know that before this can be brought to a finality there must be a balancing of the country's needs, or the people's wants.

"It is my opinion that this process of readjustment will continue for a few years at least before anything near a *perfect* balancing of relationships between all commodities can be accomplished. My forecast is that we will describe the drop of a park roller-coaster, i. e., a dip down and then up again (not quite so high as before) and then down a little lower than before and up again and so on until complete readjustment is acomplished, and that during the period of each "dip" good-road construction will be at its best, for it will furnish the cushion for unemployment or the shifting of labor."

Stabilization of Prices More Important than Reductions

President of the Illinois Society of Architects Says Costs of Construction Are Now Governed by High Wages and High Freight Rates

By F. E. DAVIDSON

EVERYONE INTERESTED in the building industry must know that building costs are lower than they were at the peak during the year 1920.

So many erroneous statements, however, have recently been presented as to the amount of these decreases—statements that so evidently have been based on either incomplete data or have been issued in an attempt to create a false impression of the actual situation—that it appears to be opportune that those interested in building construction should be advised as to approximately how much cheaper buildings may be constructed today than at the high level of 1920.

1914 Prices Still Far Off

Predictions to the effect that by May 1 next "1914 price levels for building costs will be reached" are so absurd as to justify the serious questioning of the sanity of any man making such a prediction. Nevertheless, at present, the building public is waiting and hoping for lower prices, and, like a small boy passing a graveyard at night, is whistling to keep up his courage.

Labor and Rail Rates Key Items

It is, of course, obvious to every student of the situation that until labor costs are lowered and freight rates are reduced, building costs cannot and will not be materially lower than they are at present.

As I predicted, the average price level of building material costs will follow in general the price level of all commodities, and the price level of commodities will parallel the curve representing monetary circulation, as well as loans and discounts. The American public must become accustomed to doing business on a higher price level than before the war. Price levels will never recede to or even approximate pre-war levels.

"Stabilize Conditions"

What every student of economic conditions should do, what every architect must do, is to teach the public some of the fundamentals of economic laws and assist in promoting the economic truth that the best interests of our nation at this time will not be subserved by the wiping out of any portion of our circulating medium, or in making any material reduction in the volume of credits, but in the stabilizing of conditions.

As soon as those interested in building construction have been convinced that costs are more or less stabilized, construction work will start, and all of the conventions and conferences that may be held will not change or affect this economic fact.

Let us, therefore, face conditions as they are, and so shape our course as to be in accord with economic laws which cannot be amended by any resolution of any convention, or act of legislation.

Illinois Sand, Gravel, Stone and Slag Men Unite

Change Sand and Gravel Producers' Association to a "Concrete Aggregate" Association

POSSIBLY THE MOST IMPORTANT EVENT in the 1920 history of sand, gravel, crushed stone and slag associations, and certainly the most astonishing, was the rallying under one banner of the producers of these materials in the State of Illinois. For, possibly nowhere else in this country, has antagonism and misunderstanding been more pronounced than in this state.

The Illinois Sand and Gravel Producers' Association has been one of the largest and most active associations in the sand and gravel industry. Its 1920 budget was over $26,000, or nearly as much as that of the National Sand and Gravel Producers' Association during the same period. It ended the year with a $6,000 surplus.

The secretary of this association, Ben Stone, is an ex-railway traffic man, and his services during the troublous times of 1920 have been proved of great value. He has worked steadily and conscientiously with the railway officials direct and with the state Public Utility Commission to solve some of the problems of the members of his association, and with very excellent results, according to the general opinion.

This association is also a member of the National Industrial Traffic League, and Mr. Stone has used this connection to very excellent advantage in getting at some of the transportation problems of the industry.

To Ben Stone, credit was freely given for bringing about the union of sand and gravel and crushed stone interests. Slag men are eligible, but apparently, none has yet joined. The union of these interests in Illinois will make the new Illinois Concrete Aggregate Association the largest and most influential local association in the field, with a membership of 51 companies, operating 80 plants. In a normal year, the tonnage of these plants will probably be well over 6,000,000.

The crushed stone men were received most cordially and the constitution of the association changed to give them the full privileges of membership by unanimous vote.

President M. D. Schaff's address was brief, but pointed. He quoted from the recent annual report of the Secretary of the Interior, Washington, D. C., highly commending association work and mentioning particularly the commendable activities of sand and gravel associations in 1920. Mr. Schaff said if this was the attitude of a cabinet officer, certainly no ground was left for those who did not believe in association work.

At the Association luncheon, R. M. Field, traffic manager of the Peoria Association of Commerce and president of the Illinois District of the National Industrial Traffic League, gave an extensive history of the struggle of railroad shippers for justice from the railways. He related at some length how the recent (1920) Transportation Act has changed the character of the Interstate Commerce Commission and made it the ally of the railways rather than the shippers.

M. D. Schaff, president of the new Illinois Concrete Aggregate Association

On the other hand, he made it clear that the railways were in desperate straits and were never in a more conciliatory attitude toward shippers than now. The National Industrial Traffic League, he said, was taking advantage of this situation to sit in with the vice-presidents of the railways in charge of traffic and to co-operate with them in the formation of policies and measures of advantage to both the railways and the shippers. He believed that much could be accomplished by this kind of co-operation, but believed shippers must always have strong organizations to back up their point of view.

Mr. Field made it quite plain that many other industries were suffering from the recent rate increases, although possibly none were so hard hit as sand, gravel and crushed stone producers. Railway men quite generally see the need of revising many rates downward, he said, but they hesitate to start such revision in the face of the Interstate Commerce Commission orders for advances that were originally designed to give them sufficient revenue to earn their legal 5½ per cent.

Officers for 1921

M. D. Schaff, of the Springfield-Pekin Sand and Gravel Co., Springfield, was unanimously re-elected president. Col. O. P. Chamberlain, of the Dolese & Sheppard Co., crushed stone producers, Chicago, Ill., was elected first vice-president; and G. P. Longwell, of the Consumers Co., Chicago, producers of and dealers in both sand, gravel and crushed stone, was elected second vice-president. R. E. Thomas, of the American Sand Co., Chicago, was elected treasurer. The Executive Committee, besides the president and two vice-presidents, is composed of four members, elected as follows: B. H. Atwood, Interstate Sand and Gravel Co., Chicago; J. C. Brandt, Lincoln Sand and Gravel Co., Lincoln, Ill.; H. H. Halliday, Halliday Sand Co., Cairo, Ill., and W. L. Hodgkins, Brownell Improvement Co., Chicago, crushed stone producers. Ben Stone was unanimously re-elected secretary.

U. S. Big Consumer of Potash

DURING ten months of 1920, the United States bought 220,000 tons of raw potash from the restored province of Alsace. This is more than three times the potash exports from Alsace during the German regime of 1913, which amounted to 71,000 tons.

In the first year of French occupation, the trade increased to 141,000 tons and now the regular traffic is increasing as shipments go along the Rhine to the port of Rotterdam. France consumed 370,000 tons in ten months last year and England was the next best customer, after America, importing 85,000 tons.

Ohio Sand and Gravel Men Hold Two-Day Business Session

Freight Rates, Transportation and Local Pit Competition Up for Discussion

A LARGE PART of the first day's session of the Ohio Sand and Gravel Producers' Association's annual meeting at Columbus, O., Jan. 19, was devoted to a recital of grievances and to expression of indignation at the treatment the industry has received at the hands of the government and the railways.

But, from all quarters came optimism regarding this year's outlook, particularly in road-building. In Michigan, where many Ohio operators also do business, the State Highway Commission has undertaken to have freight rates on road materials reduced. If necessary, the case will be taken to the Interstate Commerce Commission by the State of Michigan. There is a strong possibility that the State of Ohio will take similar action.

Need of Continued Co-operation

C. M. Ault, of the Barnes Sand and Gravel Co., Piketown, O., gave an excellent presentation of the functions of both the local and national associations of the industry. He said in part:

We all know the gallant fight which our state and national organizations put up against this treatment of our industry, and gentlemen, I do not think we as individual producers should be as backward as it seems to me we are, in expressing to them not only our appreciation of what they have done in the past, and continuing to co-operate with them, and encourage them to fight for the restoration of the rights of our industry in the future, to the end that that hydra-headed monster, the Interstate Commerce Commission, may be shorn of its power to sand-bag our industry along with many others at the behest of the coal industry in the most audacious and illegal scheme of profiteering the world has ever known.

I heard President-Elect Harding make this statement at Jackson, O.: "If elected president, I will throw the Interstate Commerce Commission out bodily and let the people and the railroads run their own business."

This was a campaign promise, but if we and other industries get behind him and do not let him forget it, he may see that the job is done. Courage to his heart and strength to his arm.

While I believe this to be the most important object for our national organization at present, there are others such as general freight rate structures, car service, and demurrage problems to be worked out, and in the future many others will arise and it certainly behooves us to be ready with an organization and capable officers to meet these problems.

We have come to the conclusion that the business manager of our national association would be a very good man to assist us in getting income tax matters before the proper persons in the proper manner. We have not as yet asked him to do this, but are likely to ask his assistance some time in the future and feel sure that any help he can give us will be given freely.

We also believe our national organization will be on the job to look after our interests as they may be affected by any law proposed regarding income tax, production tax, or otherwise affecting our industry. I am mentioning all these to show to you the need of co-operation and organization.

Guy C. Baker
Executive secretary, Ohio Sand and Gravel Producers Association

It is necessary from now until our state legislature adjourns to have someone scan every bill offered that might adversely affect our industry and combat it.

Only yesterday I learned that a bill had been introduced taxing the production of minerals in this state. We as individuals can co-operate with our officials by seeing or writing our senators and representatives about these proposed laws when called to our attention.

We should continue to co-operate, because we can be of assistance to one another in the various phases of our plant production and the sale of our products. As an example of the benefits along this line, I will say that I picked up two ideas at Louisville last week that I believe will be worth several times the value of my time and expenses to my firm.

Last, but not least, we should keep up our organization for the social feature if for no other reason. I do not believe that anyone who was at Louisville regretted spending the time and money, and I assure you that those who were not there missed a rare treat.

Let us stand together, shoulder to shoulder behind our various officers the coming year, and carry them forward to the goal of victory, promotion and publicity.

Local Pit Competition

A straight heart-to-heart talk on the construction and maintenance of county roads by R. H. Smith, county highway engineer, Urbana, Ohio, contained much food for thought, and some comfort, for the sand and gravel industry. Mr. Smith, as county engineer, made it clear that he was concerned only in getting the cheapest and best material, regardless of the source from which it comes.

He explained quite fully the advantages and disadvantages of local material, as compared with the commercial product. Because uniformity of the material is the most important consideration, there is never any question as to which is the most *desirable*. But if freight rates make the cost of the commercial material too high, it becomes a question of engineering economy whether to use the local material and re-build the road within the probable period of life of the better-constructed road, or to build the road with the best material at the much higher cost.

Mr. Smith gave some excellent examples of how better roads were linked up with a better public school system. He asked the assistance of the sand and gravel men in putting a law on the statute books of Ohio which will compel engineers to pass an examination and take out a license before practicing their profession.

Officers for 1921

The officers of the Ohio Sand and Gravel Producers Association elected for the ensuing year are: President, F. E. Hall, of T. J. Hall & Co., Cincinnati; vice-president, E. A. Evans, Zanesville Washed Gravel Co., Zanesville, O.; secretary-treasurer, F. C. Fuller, Portsmouth Sand and Gravel Co., Portsmouth, O.; executive secretary, Guy C. Baker, Greenville Gravel Co., Greenville, O.

Practical Chemistry for Lime and Cement Manufacturers

XXI. The Chemistry of Combustion—Specific Heat and Thermal Capacity

By Richard K. Meade, M. S.
Consulting Chemical and Industrial Engineer, 11-13 Fayette Street, Baltimore, Md.

I HAVE ALREADY mentioned the fact that the quantity of heat necessary to raise the temperature of a known weight of water through any given number of degrees is fixed. This is also true of other bodies than water. The ratio of the heat required to raise the temperatures of a given weight of any other substance one degree to that required to raise the temperature of the same weight of water one degree is commonly called the "specific heat" of the substance. The quantity of heat necessary to raise the temperature of a given weight of a body one degree may be found by multiplying the specific heat of the body by the weight of the body. Thus the specific heat of iron is 0.1050 and the heat necessary to raise the temperature of 1 lb. of iron one degree is 0.1050 B.t.u.

The specific heat of a substance increases with the temperature. Thus the specific heat of carbon dioxide may be expressed by the formula $0.19 + 0.00012t$, in which t denotes the temperature (°F.) at which the specific heat is desired. At 0°F. the specific heat is, therefore, 0.19, at 1°F. it is 0.19012, at 10°F. it is 0.1912, etc. The mean specific heat between 0°F. and t°F., or between t°F. and T°F., is, of course, one-half the increase; hence the mean specific heat of carbon dioxide between 0°F. and t°F. is $0.19 + 0.0006t$, and between t° and T°F. is $0.19 + 0.00006\ (T - t)$.

The Thermal Capacity of a body is the amount of heat necessary to raise a given weight of it to any given temperature. Or more generally the heat expressed in B.t.u. (or Cal.) necessary to raise 1 lb. (or one kilogram) through one degree Fahrenheit (or Centigrade). Since one B.t.u. is required to raise 1 lb. water 1°F., it is only necessary to multiply the specific heat by one to obtain the thermal capacity. For this reason the two terms, "specific heat" and "thermal capacity," are often used one for the other. So far as the mathematics goes the thermal capacity of one pound of a substance is the same number of B.t.u. as its specific heat. In the case of volumes of gases, however, this is not the same.

In order to find the thermal capacity of a cubic foot of gas it is necessary to multiply the weight in pounds of a cubic foot of gas by its specific heat. In the following table will be found the mean specific heat of the more common gases. To find the actual heat necessary to raise any of these gases from 0 to T degrees, multiply the mean specific heat between 0° and T by T, the result will be the quantity of heat. Thus to find the heat necessary to raise one pound of carbon dioxide from 0° to 1000°F., first find the mean specific heat between 0°C. and 1000°F. or $0.19 + 0.00006 \times 1000 = 0.25$; then multiply this by the rise in temperature for the total quantity of heat or $0.25 \times 1000 = 250$ B.t.u.

MEAN THERMAL CAPACITIES OF SOME GASES

From 0—3600°F. (2000°C.) in B.t.u. per lb.

Gas	Mean Specific Heats B.t.u. Per Lb. t = °F.
Hydrogen	$3.370 + 0.0002t$
Nitrogen	$0.2405 + 0.000012t$
Oxygen	$0.2104 + 0.000010t$
Water (vapor)	$0.42 + 0.00010t$
Carbon Monoxide	$0.2405 + 0.000012t$
Carbon Dioxide	$0.19 + 0.00006t$
Air	$0.234 + 0.000012t$

From 0—3600°F. (2000°C.) in B.t.u. per cu. ft.

Gas	Mean Specific Heats B.t.u. Per Cu. Ft. t = °F.
Hydrogen	$0.0188 + 0.0000009t$
Nitrogen	$0.0188 + 0.0000009t$
Oxygen	$0.0188 + 0.0000009t$
Water (vapor)	$0.022 + 0.000005t$
Carbon Monoxide	$0.0188 + 0.000007t$
Carbon Dioxide	$0.023 + 0.000007t$
Air	$0.0188 + 0.0000009t$

Gases leaving the stack of a cement kiln at 1400°F. will have a mean thermal capacity of about 0.025*, and hence will carry off 1400 x 0.025 or 35 B.t.u. per cubic foot. If they left at 400°F. they would only carry off 10 B.t.u. per cubic foot. Hence the desirability of reducing the volume of gases to the least amount consistent with proper combustion, which is done by cutting down the excess air. Since the heat carried off is in direct proportion to the temperature, it is desirable to cut down their temperature also. The latter can, of course, only be obtained by absorbing this heat in the furnace.

*To find the mean thermal capacity of a mixture of gases, multiply the percentage of each gas present by its mean thermal capacity and divide by 100.

(To be continued)

Beginning of the Vermont Marble Company

ABOUT NINETY YEARS AGO, a piece of land with an area of half a mile square was taken in exchange for an old mare. The man who acquired the land in this historic trade one day noticed that an outcropping rock was of dazzling whiteness. It proved upon examination to be marble of exceptional quality, and on this small piece of land there was developed what at one time was believed to be the most valuable deposit of marble in the world.

With the development of this deposit, the name of Redfield Proctor is indissolubly linked. Born in the same town in which the horse was traded for the land, in the year after the consummation of that notable transaction, his business talents were used in building up a remarkable business, which, in turn, supported him while he gave a noble public service to his town, his state and his nation.

Redfield Proctor graduated in law at 28 years of age. Two years later he entered the Union Army as a lieutenant, was rapidly promoted to major, then colonel. After the war, he practiced law for a few years and then assumed the management of the marble quarries which are among the most important in the world.

Proctor's political life began in the Vermont lower house in 1867, and was marked by constant growth in responsibilities. Under President Harrison, he was made Secretary of War, and in 1891 he entered the United States Senate, where he served with distinction. He passed away in 1908, after an unusually useful public and business life.

Many men are known by their public careers, but few persons know what industrial activities make it possible for such men to carry forward careers of great value to the country.

The marble deposit in Proctor was worth but the price of an old mare until the knowledge, enterprise and activity of Redfield Proctor made it the largest single marble quarry and the greatest marble-working plant on earth.—"Bershire Stone Tablet," published monthly by the Bershire Stone Products Corp., South Egremont, Mass.

Immediate Support of the Dye Bill is Needed

Secretary of the National Lime Association Explains Why Limestone Industry Should Support This Measure

THE DYE BILL, H. R. 8078, has been before Congress since early in the first session last summer. It is one of the very important bills before Congress on which a decision should be reached before Mar. 4. The central staff has been investigating this measure, and from its study believes that it is entitled to and needs the hearty support of all lime manufacturers at this time.

At the invitation of the National Lime Association, a recent meeting of its staff committee was attended by Dr. Charles N. Herty, editor of the "Journal of Industrial and Engineering Chemistry," of New York City, and by Dr. Charles L. Parsons, secretary of the American Chemical Society, who explained the various ramifications of this proposed measure through the chemical industries of America and its bearing upon other important American interests. They also reminded the Lime Association of its relations to the chemical lime industry.

These facts should be put before all limestone quarry operators and should lead all lime manufacturers, at least, to use their influence in favor of its passage.

Whole Chemical Industry Involved

The Dye Bill is far more than merely a measure for the protection of an infant American industry for making dyes. The bill proposes to protect, not only the specific dyes, but the coal tar products from which they are derived. For this latter reason it has a wide and intimate ramification through the chemical industries of this country. Its passage will add largely to their vitality and strength. Its failure, in the face of the strong government protection that foreign manufacturers of this kind are likely to have, will be a serious interference with American chemical manufacturers. This statement will be the more apparent when it is remembered that 60 per cent of the lime manufactured in this country now goes into chemical uses. The countries of England, France and Japan already have laws protecting their markets from the outside product, which has come chiefly from Germany. The failure of this bill would make America largely a dumping ground for such chemicals.

Every limestone quarry man is concerned in a business way as a lime and limestone producer because the dye industry provides an outlet for a substantial tonnage of lime and limestone, and further, in the related chemical industries which this bill would in large measure vitalize, a much larger tonnage of lime is consumed. Manufacturers of building and agricultural lime and all limestone quarry men are affected, indirectly, since the enlargement of the demand for lime and limestone in the chemical field will relieve them of that amount of competition in their own field.

For American Defense

Important as are these commercial considerations, there is a broader aspect to this question. The coal tar products are the basis from which many of our most important explosives are made, and the dye factory is a potential munitions factory, into which it can be transformed over night. In these modern days, no nation can consider itself equipped for the exigencies of war without such factories. The United States should be soundly prepared in this direction and the provisions of the Dye Bill are the key to that protection.

Briefly, the status of the measure is as follows: Having passed the House at the last session, it has also been approved by the Finance Committee of the Senate and is now before the Senate for action. There seems to be quite a strong sentiment in Congress in its favor, but on the other hand, there is a very persistent filibuster in the Senate against its passage, and the friends of the measure in Congress need the support and cooperation of the interests in the country who appreciate the importance of this measure.

Get Busy Before March 4

If the bill is not passed before Mar. 4, it dies a natural death and must again be resurrected and go through the long process of hearings before it can possibly be adopted. In the meantime, peace may be declared, and with the removal of the protection now offered by the Trading with the Enemy Act, German dyes will flood our market with the resulting damage, falling first and most heavily upon our smaller dye manufacturer, and later upon all, including you as a lime manufacturer, and you also., Mr. Limestone Quarry Man.

To put your influence behind the passage of this bill, it is suggested that you wire and write your senators in Congress, expressing your sense of the importance of this measure, and urge that it be put forward to early passage; second, communicate with your congressman and urge him to use his influence with his colleagues in the Senate to secure the same result. Keep after them at intervals until the press is able to announce the passage of the bill.

E. L. Marsh Elected Treasurer of U. S. Gypsum Co.

E. LEA MARSH, a prominent citizen of Sandusky, Ohio, has been elected treasurer of the United States Gypsum Co., Chicago, Ill. Mr. Marsh has for some time been a director in the United States Gypsum Co., which some years ago absorbed the plaster interests of Marsh & Co. The Marsh company's plant at Gypsum, Ohio, is still one of the largest properties operated by the corporation; in fact, it is one of the big plaster mills of the world. The U. S. Gypsum Co. has plants in 28 states of the Union.

In enlisting Mr. Marsh in the active management of its great business, the United States Gypsum Co. is calling the grandson of the founder of the gypsum business in America. His grandfather, Edward L. Marsh, established at Cincinnati, Ohio, in 1843, the pioneer plaster industry of the country. It took the name of Marsh & Co. On the death of E. L. Marsh in 1884, Edward H. Marsh, the former's son, succeeded to the head of the industry. He became sole owner of the business in 1886, at which time the company's Sandusky plant, located at the foot of Wayne Street, was abandoned. This plant had been in operation for 34 years. At the same time Marsh & Co. built the large mill at Plasterbed, Ottawa County, where a wealth of gypsum deposits was to be had. After E. Lea Marsh had graduated from Yale University, he began his career as a clerk in the offices of Marsh & Co. and eventually acquired financial interests with his father in the industry. He continued his association with the gypsum business even after taking up connections with numerous other of Sandusky's industries.

Editorial Comment

Railway Partners

Sand, gravel, crushed stone and slag producers are trying to make a living producing and selling these basic building commodities. The railways are trying to make both ends meet moving these and other commodities. Higher rates than these low-priced materials can bear are depriving many producers of crushed stone, sand, gravel and slag of the ability to operate in competition with the side-of-the-road, fly-by-night type of operator. Higher rates than the traffic will bear is depriving the railways of desirable tonnage and much needed revenue.

In a way the railways are between the devil and the deep blue sea. Letters received from railway executives show that they fully appreciate the need of adjusting rates on sand, gravel, crushed stone and slag if they are going to move them. Railway profits come from tonnage and volume of business, just as do the profits in producing the materials moved. But the railways hesitate to start reducing rates which the Interstate Commerce Commission has allowed them for the specific purpose of earning their legal 5½ per cent.

Obviously there never was a time when there was greater need for co-operation between the railways and their shippers. Many shippers' organizations have already waked up to this fact and are even now dealing direct with the railway executives, gaining and giving concessions of value and to the good interests of both.

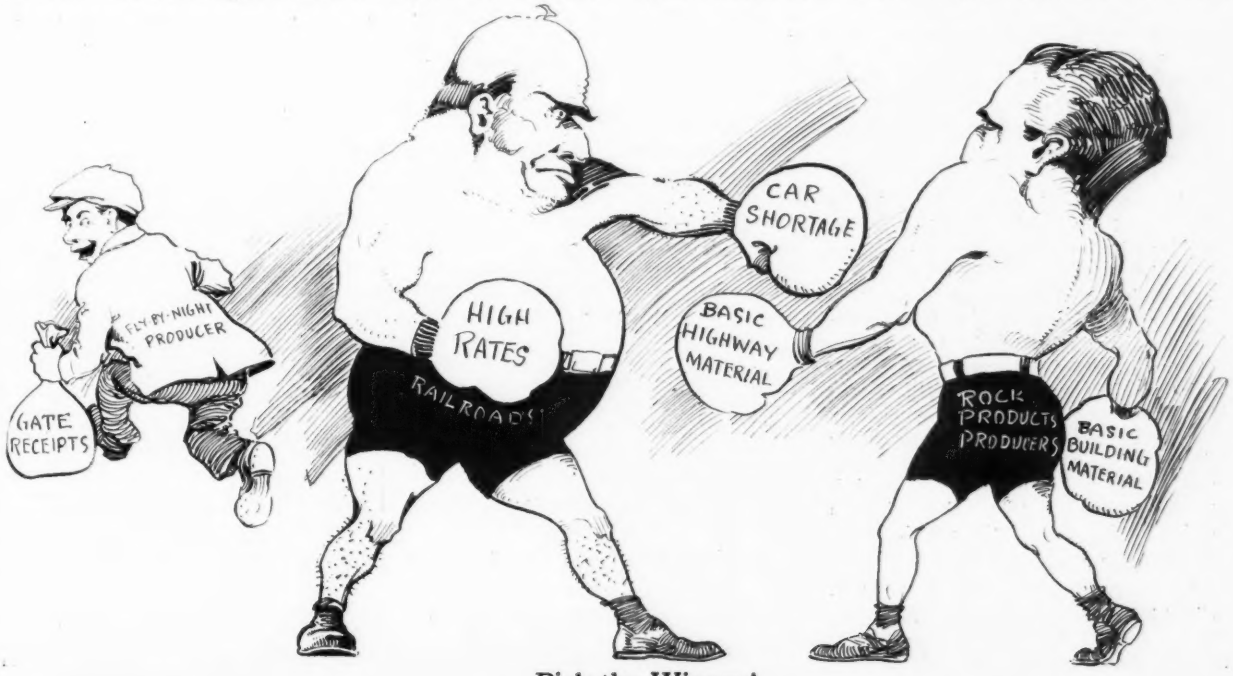
If the railway managers are any way near reasonable it seems absurd to fight with them before the Interstate Commerce Commission previous to every possible attempt to harmonize interests. Moreover, continual harping on the subject of high freight rates and the inability of commercial producers to meet local competition on this account, carried on in the public press, is actually having the effect, in some instances at least, of encouraging such competition.

ROCK PRODUCTS believes that railway executives are sincere in their professions of good faith and that some attempt to interest *them* in an immediate readjustment of rates should be made.

Protect the Dye Industry

A matter of vital importance to the lime manufacturers of the United States, and to the entire limestone quarry industry somewhat less directly, is the adequate protection of the newly established coal tar by-products industry of America from ruthless German competition. The National Lime Association is authority for the statement that 60 per cent of the lime produced in the United States now goes into chemical manufacture, the principal part of which is the production of by-products of coal tar—and among the best known of these are dyes.

Therefore, every limestone quarry man, whether or not he makes lime himself or supplies the raw material directly or indirectly, should get behind the House of Representatives' Bill No. 8078, the provisions of which have been studied and approved by the National Lime Association. More is said about this elsewhere.



Pick the Winner!

Accident Prevention

Belts and Belt Guards

Prepared for Rock Products *by the Engineering Department of the National Safety Council*

THIS IS the second of a series of articles begun in the January 15 issue of Rock Products.

Link Fasteners

Certain forms of this type avoid the need of clinching, but they are seldom suitable for better-class use. They are difficult to align and present open joints that may easily catch a garment.

Belt Guards—Overhead Belts

High Transmission—Any portion of an overhead belt which is 7 ft. or less from the floor, or which must be approached while in motion, should be guarded on the sides and bottom.

Heavy or fast-running belts more than 7 ft. above the floor, so located that should they break they would endanger persons below, should be guarded underneath. As to what constitutes a heavy or a fast-running belt, opinions vary; some engineers believe that if a belt located as above is 6 in. or more in width and the speed is 30 ft. or more per second, the belt should be guarded. The state of New Jersey requires that belts 6 in. or more in width, so located that breakage would endanger persons below, shall be guarded underneath and that the guards shall extend to the wall or ceiling in such a manner as to retain the belt should it break. The state of Pennsylvania has a similar rule, but places the width of the belt at 10 in. or more. The state of Massachusetts requires that overhead belts 12 in. or more in width and running 30 ft. or more per second, located over passageway or working places, shall be guarded. Such guards usually are constructed with frames and braces of rolled shapes, with a filler of wire mesh, expanded or perforated metal, or metal lattice.

It is obvious that the guards should be capable of withstanding not only the weight of the belt, but blows or stresses due to the possible entanglement of the belt. Such guards are usually of the hanging type and should be smooth on the inner surfaces, of a greater width than the belt, and should be brought up around the pulley upon which the belt travels downward, to avoid the broken end whipping around the guard.

Vertical and Inclined Belts

Low Transmission—All vertical and inclined belts (some authorities except cone-pulley belts and belts 1 in. or less in width) should be so guarded that a hand or other part of the body cannot project through, over, around or under the guard and be caught by a moving part. Authorities are practically unanimous that if the projection be placed 15 in. or more from any moving part, a height of 3 ft. 6 in. is sufficient for the guard. When the guard is placed less than 15 in. but not less than 6 in. from the thing guarded, the heights recommended vary from 5 ft. to 7 ft., with the majority in favor of a guard 6 ft. high, with openings in the filler not greater than 1½ in. If the clearance is less than 6 in., then the guard should be 6 ft. high with no opening in the filler larger than ½ in.

A guard should not be placed so far from the thing guarded as to invite the workman to get between the guard and the moving parts, or so far as to make it inconvenient to reach bearings, etc., while standing outside the guard. It is recommended that the maximum distance at which a guard be placed from the thing guarded should be 20 in. The council advocates the following safe practices as to heights of guards and sizes of openings in the same:

Distance from Thing Guarded	*Height of Guard*	*Size of Openings*
15 in. to 20 in.	3 ft. 6 in.	1½ in.
6 in. to 15 in.	6 ft. 0 in.	1½ in.
0 in. to 6 in.	6 ft. 0 in.	½ in.

When the upper part of a horizontal belt is less than 6 ft. from the floor level the belt may well be guarded over the top, instead of carrying the guard up 6 ft., or a 3 ft. 6 in. railing should be placed at least 15 in. and not more than 20 in. horizontally from the edge of the belt.

Floor Openings

When belts pass through a floor (or where any guard is placed around a floor opening) a 6 in. solid section or toe-board should be placed at the bottom of the guard to prevent objects rolling or being kicked through the floor opening. Where belts pass through openings in a floor or wall, provision should be made to guard against friction due to the belt rubbing on the edge of the opening. The placing of rollers at the two edges of the belt, so that if the belt rides to one side it will strike the roller and cause less wear and friction, is considered better practice than facing the opening with sheet metal, as is sometimes done.

(To be continued)

Electrical Hazards in Cement Plants

By G. Diedrich, Chief Electrician, Missouri Portland Cement Co.

ELECTRIC HAZARDS are always more or less numerous around any industrial plant. Until recent years the average cement plant overlooked altogether the dangers to the employes from unsafe electrical equipment. Poor switches and motor starting apparatus, bad insulation, fuses, poor safeguards, inexperience, and carelessness contribute to the dangers from electrical equipment.

All switches should be of an enclosed type approved by the underwriters, and the starting apparatus should be especially adapted for the cement plant, of few working parts and accessible to regular inspections. Fuses enclosed in cartridges should be used and located in the line wherever possible to give relief from any excessive strain due to overload or direct "short." Wire insulation should be good and all wires should be strung on insulated supports clear of any buildings or trees and the like. High tension lines, lightning arresters, busses and the like should be guarded from the inquisitive by fencing with a locked doorway. Transformers, motor frames, switch-boxes, starter boxes, conduit, metal railings frames at panels and the like should be grounded. With the best of safety guards, the inexperienced should not "monkey with the juice."

Fewer accidents are likely to happen in the power house or in the substation than in any other departments of a cement plant. As a rule, this part of the equipment is good; put up in a convenient, workman-like and safe manner, and, the percentage of employes at this department is small.—"Accident Prevention Bulletin" of the Portland Cement Association.

New Machinery and Equipment

Improved Cableway for Big Storage Yards

RECENT IMPROVEMENTS in cableways which make them useful for giving crane service over storage yards have been made by the Railway and Industrial Engineering Co., Greensburg, Pa. The equipment aims to eliminate the handling of the material to conveyor or car by furnishing a high longitudinal speed along the pile, making it possible to travel a considerable way from the plant, pick up a load and convey it rapidly to the plant or vice versa. This has been accomplished by adopting the cableway principle which affords high longitudinal speeds with light moving weight of operating parts, and the lateral service is provided by means of a rocking motion which is given to terminal towers, these towers being rocked in unison so that the main track cable is transferred laterally.

The towers are balanced by counterweight for any angle of inclination which they may have. The rocking of the towers is done independently of the travel of the carriage on the main track cable and the hoisting and travel functions are operated in the same way as in ordinary cableways. This makes a light and fast method of handling either bulk material or material which is ordinarily served with a crane hook. It makes it possible to pile or deliver in selective piles, as movement from pile to pile is rapid.

Owing to the sweep of the main cable which follows very closely the contour of a natural pile, all that can be piled can be reclaimed. No retaining walls or trestles are required, as cars can be unloaded from the top or dump bottom cars can be dumped into track hoppers from which the load can be taken.

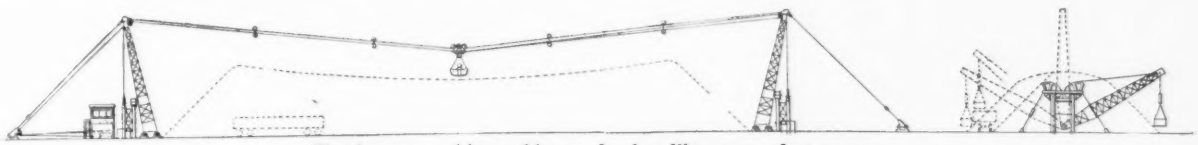
Owing to the angle of rock, the hoisting of the load is a short distance, and if a car is being unloaded it is only necessary to hoist high enough to clear the pile or side of the car, after which the bucket will clear the pile without further hoisting. The bucket is always parallel to the car when loading or unloading, as there is no rotary motion to be overcome. The yard is left clear of obstructions of any kind.

The width of the pile is 70 per cent greater than the height of booms for lengths up to 400 ft. of cableway. Where necessary, piles can be made of great height of the two booms only. It is explained that in balancing, all of the dead weight of booms, cables, carriage, bucket, and such portion of the live load as is desired can be accurately balanced and the balance is perfect regardless of the position of the towers, or the location of the carriage and the main cable.

The rocking motion is obtained by gearing the tower by pinion to a gear quadrant supported on structural steel, and rock of the tail tower is kept in unison with the hoist tower by two cables stretched between the towers which operate the mechanism in the tail tower, working through a pinion and gear segment similar to that at the hoist tower. Suitable automatic stops and safety stops are provided to cut out over-travel and in case of rope breakage. The strain of the main cable is taken by guys which are connected to oscillating anchors, the oscillating anchors being in line with the pivots of the main towers so that regardless of the position of the towers the length of guy and main cable is not altered.

The device gives fast crane service over depressions in the ground, as the main cable can be stretched across openings where it is impossible to get supports or tracks for any sort of mechanism. It can be operated either by steam or electricity and requires only one operator. The operating ropes are carried from the hoist to sheaves at the main anchor and then to the top of the tower. This arrangement prevents variation in the length of the operating cable as the towers are rocked. The hoists are standard cableway hoists and can be used to operate with any type of bucket or crane.

The balance of the tower is taken care of by means of a vertical sliding weight hung on the cable which is fastened at the top of the tower. When the tower rocks to one side this cable lies over a sheave quadrant which is located in such relation to the motion of the tower as to increase the effective resisting angle between the cable and the center of the tower. This means the weight can be balanced exactly for any angle or inclination. As the tower rocks from side to side, the counterweight cable simply lays off of one sheave quadrant on to the other, and when the tower is vertical the counterweight effect is zero, the maximum effect of counterweight occurring when the towers are at the limit of their travel at one side or the other.



Harrington rocking cableway for handling ground storage

A Machine for Straightening Bent Track Spikes

A MACHINE developed for the purpose of reclaiming bent track spikes has recently been developed. Such a machine should be particularly useful in quarry operations where trackage is constantly being shifted to suit quarry conditions, and consequently a great number of bent track spikes are thrown away.

The machine weighs about 70 pounds, is made of high grade electric steel castings, heat treated, and all wearing parts are case hardened. The spikes are squeeged, thereby eliminating excessive wear in the grooves. The grooves are commonly made for two sizes of spikes, 9/16 by 5½ and ⅝ by 6, but the manufacturers will furnish them for any size required. It is claimed that the machine will straighten a spike that is bent and twisted at nearly right angles. The machine is known as the Butler Spike Shaper. It is manufactured by the Werner Machine Co., West Allis, Wis.

New Portable Electric Drill

A NEW automatic-stop electric portable drill has been developed and recently placed on the market.

This portable drill is motor driven, using either alternating or direct current and automatically stops when not in use. This is due to the fact that the current contact functions through a spring lever in the handle which is released as soon as the pressure of the operator's grip is removed, much on the same order as the valve on a pneumatic hammer. The machine is known as the Wodack Drill and is manufactured by the Wodak Electric Tool Corp., Chicago, Ill.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.			1.40 per net ton, all sizes			
Burlington, Vt.	1.00	.....	2.50	2.00	2.00	.....
Califon, N. J.	1.80	2.25	2.00	1.80	1.80	.....
Chaumont, N. Y.	1.75	1.75	1.75	1.50	1.50	1.50
Coldwater, N. Y.	1.80	1.80	1.80	1.65	1.65	2.00@2.25§
Grove, Md.	1.45	2.50	2.40	2.00	1.60	1.45
North Leroy and Akron, N. Y.	.70	1.25	1.25	1.25	1.25	1.25
Redington, Pa. (dolomite)	1.35	1.85	1.85	1.85	1.85	1.85
Utica, N. Y.	1.00		All other sizes 1.50			
Vernoy, N. J.	2.00	2.25	2.00	1.80	1.60	.....
CENTRAL						
Alden, Ia.	1.00	.....	1.50	1.45	1.45	.....
Alton, Ill.	2.25	.....	1.85	1.75	.....	.....
Bettendorf, Ia.			All sizes, 2.00 cu. yd.			
Buffalo, Ia.	.90	1.35	1.45	1.25	1.25	1.35
Chicago, Ill.	1.41	2.00	1.53	1.41	1.41	1.41
Cincinnati, Ohio	.....	2.00	2.00	2.00	.....	.....
Cleveland, Ohio	.....	2.40	2.20	2.20	.....	.....
Columbia, Ill.	2.15	1.90	2.00	2.00	1.90	1.90
Coralville, Ia.	1.25	1.65	1.65	1.50	1.40	.....
Davenport, Ia.	1.50*	1.50*	1.50*	1.50*	.....	.....
Dundas, Ont.	1.00	1.50	1.50	1.35	1.25	1.20
Eden and Knowles, Wis.	1.30	1.30	1.30	1.30	1.30	.....
Ft. Wayne, Ind.	1.60	1.90	1.90	1.80	1.60	1.60
Greencastle, Ind.	1.50	1.50	1.25	1.25	1.25	1.25
Illinois, Southern	2.25	1.75	1.75	1.75	1.50	.....
Kansas City, Mo.	.60	2.00	.....	.....	.....	.....
Kokomo, Ind.	1.10	1.10	1.25	1.20	1.10	1.10
Krause or Columbia, Ill.	1.80	1.30	1.50	1.40	1.30	1.30
Lannon, Wis.	1.25	1.25	1.25	1.25	1.25	1.25
Lima, Ohio	1.70	1.60	1.50	1.50	1.50	1.50
Linwood, Ia.	1.00	.....	1.45	1.25	1.25	.....
Mansfield, Ohio	1.70	2.20	2.00	1.90	1.70	1.70
Mayville, Wis.	.95@1.00	.....	1.20	1.20	1.20	1.20
Montrose, Ia.	1.35	1.75	1.75@1.85	1.75	1.65@1.75	.....
Oshkosh, Wis.			1.40 per ton, all sizes			
Ottawa or Hall, Can.	2.00	2.25	2.25	1.75	1.75	.....
River Rouge, Mich.	1.25	1.50	1.50	1.50	1.25	1.25
St. Louis, Mo.	.60	1.60	.....	.....	.....	.....
Sheboygan, Wis.	1.30	1.30	1.30	1.30	1.30	1.30
Stolle, Ill. (I. C. R. R.)	.....	1.85	1.85	1.85	1.85	1.85
Stone City, Ia.	.80	.....	1.65	1.55	1.45	.....
Toledo, Ohio, f. o. b. cars	1.85	2.10	2.10	2.10	1.85	1.85
Toronto, Canada	1.75	2.40	2.40	2.40	2.15	2.15
SOUTHERN:			These prices include 90c freight			
Cartersville, Ga.	.....	.....	2.00	2.00	2.00	2.00
Chickamauga, Tenn.	1.50	1.75	1.75	1.75	1.75	1.75
Columbia, S. C.	1.00@1.25	3.50	3.50	3.50	.....	.....
El Paso, Tex.	1.00	1.00	1.00	1.00	.....	.....
Fort Springs, W. Va.	1.85	2.00	2.00	1.70	1.60	.....
Garnett, Okla.	.65	.....	1.75	1.75	1.60	.....
Mascot, Tenn.	.....	1.50	2.00	.....	1.50@2.00	.....
New Braunfels, Tex.	.60	1.75	1.75	1.50	1.50	1.50
WESTERN:						
Atchison, Kans.	.50	2.10	2.10	2.10	2.10	2.10
Blue Springs and Wymore, Neb.	.20	1.95	1.95	1.85@1.90	1.75@1.80	1.70
Kansas City, Mo.	.60	2.00	.....	.....	.....	.....
Duluth, Minn.	1.00	2.25	2.00	1.50	1.50	1.50

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md.	1.25	2.50	2.35	2.25	2.00@2.25	2.00
Bernardsville, N. J.	2.00	2.20	2.00	1.80	1.50	.....
Branford, Conn.	.80	1.75	1.65	1.45	1.25	.....
Birdsboro, Pa.	1.40	1.90	1.80	1.60	1.60	1.40
Bound Brook, N. J.	2.50	2.75	2.25	2.10	2.10	.....
Dresser Jct., Wis.	.75	2.45	2.45	2.15	2.00	2.00
Duluth, Minn.	1.00	2.25	2.00	1.50	1.50	1.50
E. Summit, N. J.	2.50	3.00	2.75	2.30	2.30	.....
Glen Mills and Rock Hill, Pa.	1.60	1.90	1.90	2.25	2.10	1.90‖
New Britain, Middlefield, Rocky Hill, Meriden, Conn.	.60@1.00	1.60@1.80	1.60@1.80	1.40@1.50	1.20@1.30	.....
Oakland, Calif.	1.15	1.15	1.15	1.15	1.15	1.15
San Diego, Calif.	.50@ .70	1.45@1.75	1.40@1.70	1.30@1.60	1.25@1.55	.....
Westfield, Mass.	.60	1.35	1.30	1.20	1.10	.....
Winchester, Mass.	1.60	.85	.85	2.10	1.85	1.60

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md.—Gneiss	1.00	2.75	2.40	2.20	2.10	1.75
Dundas, Ont.—Flint	1.10	1.10	1.10	1.10	1.10	1.10
W. Barre, Pa.—Quartzite	.90	1.20	1.20	1.70	1.35	1.10
Holton, and Bolingbroke, Ga.—Granite	.40	.....	2.75	2.50	2.25	2.25
Little Falls, N. Y.—Syenite	.90	1.30	1.30	1.80	1.60	1.30
Middlebrook, Mo.—Granite	4.00	.....	2.00	2.00	.....	1.50‡
Ottawa, Can.—Granite	5.50	5.00	5.50	5.00	.....	.....
Stockbridge, Ga.—Granite	.50	2.00	1.90	1.75	1.75	.....
White Haven, Pa.—Sandstone	1.20	1.60	1.70	2.00	1.85	1.70

*Cubic yard. †Agrl. lime. ‖R. R. ballast. §Flux. ‡Rip-rap. a 3-inch and less.

Agricultural Limestone

EASTERN:

Coldwater, N. Y.—Analysis, 56.77% $CaCo_3$, 41.74% $MgCo_3$—70% thru 200-mesh, 95% thru 40-mesh; bags, **$5.00; bulk** 3.25

Chaumont, N. Y.—Analysis: $CaCo_3$, 95%; $MgCo_3$, 1.14%—Thru 100 mesh); **sacks, 4.50; bulk**..... 2.75

Gasport, N. Y.—90% thru 50 mesh, bulk, 2.50; bags..... 4.25

Grove City, Pa. — Analysis: $CaCo_3$, 94.75%; $MgCo_3$, 1.20%—(70% thru 100 mesh); 80 lb. ppr., 5.50; bulk..... 4.50

Grove, Md. — (50% thru 50 mesh); paper bags, 6.50; bulk..... 4.50

Hillsville, Pa.—Analysis, $CaCo_3$, 96% (70% thru 100 mesh); sacks, 5.00; bulk 3.25

Jamesville, N. Y.—Analysis, $CaCo_3$, 89.25%; $MgCo_3$, 5.25%; bulk, 2.75; sacks 4.50

Syracuse, N. Y. — Analysis, 90% carbonates (50% thru 100 mesh, 90% thru 50 mesh); sacks, 3.50; bulk..... 2.75

Walford, Pa. (50% thru 100 mesh; 60% thru 50; 100% thru 10); sacked, 5.00; bulk..... 3.25

West Stockbridge, Mass., Danbury, Conn., No. Pownal, Vt. — Analysis: Combined carbonate, 95%—33% thru 200 mesh; 66% thru 100; 100% thru 40. Bulk 3.25

Williamsport, Pa. — Analysis, $CaCo_3$, 88-90%; $MgCo_3$, 3-4%—(50% thru 50 mesh); bulk..... 4.00@5.50

CENTRAL:

Alden, Ia.—Analysis, $CaCo_3$, 99.16% ..... .80

Alton, Ill. — Analysis: $CaCo_3$, 96%; $MgCo_3$, 0.75%—50% thru 4 mesh..... 2.25

Bedford, Ind.—(90% thru 10 mesh) **Analysis, $CaCo_3$, equivalent 98.5%**..... 2.00

Belleville, Ont.—Analysis, $CaCo_3$, 90.9%; $MgCo_3$, 1.15% (45 to 50% thru 100 mesh; 61 to 70% thru 50 mesh); bulk 2.50

Chicago, Ill.—Analysis, $CaCo_3$, 53.63%; $MgCo_3$, 37.51%—90% thru 50 mesh 1.50

Columbia, Ill., near East St. Louis (⅛-in. down) ..... 1.25@1.80

Elmhurst, Ill. — (Analysis, $CaCo_3$, 35.73%; $MgCo_3$, 20.69%) 50% thru 50 mesh 1.25

Greencastle, Ind.—(Analysis $CaCo_3$, 98%), 50% thru 50 mesh..... 2.00

Howenstein, O.—100% thru 10 mesh; 59% thru 50; 39% thru 100..... 2.75@3.00

Lannon, Wis.—(90% thru 50 mesh) Analysis, 54%, $CaCo_3$; 44%, $MgCo_3$ 2.00

Marblehead, O. — (Analysis: $CaCo_3$, 95.33%) 100% thru 100 mesh, sacks, 5.25; bulk 3.00

Mayville, Wis. — $CaCo_3$, 53.65%; $MgCo_3$, 43.72% ..... 1.75@2.00

McCook, Ill.—Analysis, $CaCo_3$, 54.10%; $MgCo_3$, 45.04% — 100% thru ¼-in. sieve; 78.12% thru No. 10; 53.29% thru No. 20; 38.14% thru No. 30; 34.86% thru No. 50; 22% thru 100 ..... 1.50

Milltown, Ind. — (Analysis, $CaCo_3$, 94.41%; $MgCo_3$, 2.95%); 28% thru 100 mesh; 25.2% thru 200 mesh; 34.4% thru 50 mesh..... 1.65

Montrose, Ia.—(90% thru 100 mesh).

Piqua, O. — Analysis: $CaCo_3$, 82.8%; $MgCo_3$, 8.2%; neutralizing power in terms of calcium carbonate, 95.3%—50% thru 100 mesh..... 3.50@5.50

50% thru 50 mesh..... 1.75@2.00

Ridgeville, Ind.—(Analysis $CaCo_3$, 98%), 100% thru 4 mesh..... 1.75

River Rouge, Mich.—Analysis: $CaCo_3$, 54%; $MgCo_3$, 40%; bulk..... .80@1.40

Stolle, Ill. (near East St. Louis on I. C. R. R.)—(Thru ⅛-in. mesh); Analysis, $CaCo_3$, 89.61 to 89.91%; **$MgCo_3$, 3.82%** 2.75

St. Paul, Ind.—Analysis, $CaCo_3$, 85%; $MgCo_3$, 12%..... 1.50

Stone City, Ia.—Analysis, $CaCo_3$, 98% (50% thru 100 mesh)..... .80

Toledo, O.—Analysis, $CaCo_3$, 52.72%; $MgCo_3$, 43%—(20% thru 100 mesh); 30% thru 50; 80% thru 100; 100% thru 5/32 screen)..... 1.80

Whitehill, Ill.—Analysis, $CaCo_3$, 97.12%; $MgCo_3$, 2.50%—

50% thru 100 mesh..... 5.00

50% thru 50 mesh..... 2.25

(Continued on next page.)

Agricultural Limestone

(Continued from preceding page.)

SOUTHERN:	
Carterville, Ga.—Analysis: 96% combined carbonates—pulverized limestone	2.75
Clarement, Va. (Marlime)—Analysis, 90.94% $CaCo_3$, 0.31% P., 1.36% Mg., 0.37% K.; bulk	4.50
100 lb. ppr. bags	6.00
100 lb. cloth bags	6.50
Dittlinger, Tex.—Analysis, $CaCo_3$, 99.00%; $MgCo_3$, .04%—	
90% thru 100 mesh	2.00
90% thru 4 mesh	1.00
Grovania, Ga.—Analysis, $CaCo_3$, 95%; $MgCo_3$, none—50% thru 100 mesh	2.50
Hopkinsville, Ky.—Analysis, 94.6 to 98.1% $CaCo_3$—Bulk	2.00
Knoxville, Tenn.—Pulverized	2.50
90% thru 100 mesh	3.00
Linnville Falls, N. C.—Analysis, $CaCo_3$, 53%; $MgCo_3$, 42%—50% thru 100 mesh; sacks, 4.50; bulk	3.00
Marion, Va.—Analysis, 90% $CaCo_3$—(50% thru 100 mesh)	2.50
Memphis Jct., Ky.—(Analysis, $CaCo_3$, 95.31%; $MgCo_3$, 1.12%); average price, ¼ in. down	2.00
Mascot, Tenn.—Analysis, $CaCo_3$, 52%; $MgCo_3$, 38%—	
(80% thru 100 mesh)	3.00
(All thru 10 mesh)	2.50
(80% thru 200 mesh)	5.00
Paper bags, $1.50 extra per ton; burlap, 2.00 extra per ton.	
Maxwell, Va.	2.50
Mountville, Va.—Analysis, $CaCo_3$ 76.6%; $MgCo_3$, 22.83%—100% thru 20 mesh; 100 lb. ppr., 7.00; bulk	5.50
Ocala, Fla.—Analysis, $CaCo_3$, 98%—(75% thru 200 mesh)	4.50
Tyrone, Ky.—Analysis, $CaCo_3$, 90%; $MgCo_3$, 4%—90% thru 4 mesh	1.75@2.25
WESTERN:	
Cement, Calif.—Analysis, $CaCo_3$, 95%; $MgCo_3$, 2%—(50% thru 50 mesh)	5.00
Colton, Calif.—Analysis: $CaCo_3$, 95%; $MgCo_3$, 1½% (all to pass 14 mesh)—bulk, 3.50; bags	4.50
Sacks, 15c extra, returnable.	
Kansas City, Mo., Corrigan Sid'g—50% thru 50 mesh; bulk	2.00
Oro Grande, Calif.—Analysis: $CaCo_3$, 94%; $MgCo_3$, 2%; 85% thru 200 mesh; $4.00, bulk; bags	10.25
Terminus, Calif.—Analysis, 96.4% $CaCo_3$, 1.3% $MgCo_3$—(60% thru 200 mesh; 80% thru 100 mesh; 100% thru 50 mesh); sacks, 6.00; bulk	5.25
Tulsa, Okla.—90% thru 4 mesh	.65

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated.

GLASS SAND:	
Berkeley Springs, W. Va.	2.75
Bridgeton, N. J.—Washed, 2.50; dried	3.00
Cedarville and South Vineland, N. J.—Damp, 2.50; dry	3.00
Columbus, Ohio	2.50@3.00
Gray Summit, Mo.	2.50@4.00
Hancock, Md.—Damp	2.00
Klondike and Pacific, Mo.	2.50@4.00
Leesburg, Pa.—Core, and molding coarse	3.00
Mapleton, Pa.—Dry	4.00
Glass, damp	3.00
Massillon, Ohio	3.50
Millington, Ill.	2.25@3.00
Mineral Ridge, Ohio	4.00
Montoursville, Pa.—Green, washed	2.00@2.75
Morgantown, W. Va.	3.00@3.25
Oregon, Ill.—Large contracts	2.00@2.50
Ottawa, Ill.	2.50
Pittsburgh, Pa.—Dry, 4.00; damp	3.00
Robinson, Md.—Washed, damp	2.00
Rockwood, Mich.	3.00@4.00
Round Top, Md.—Glass and damp, $2.50; core	2.25
St. Marys, Pa.—Green	3.00
Sands, Elk Co., Pa.—Selected, green	2.75
Thayers, W. Va.—Washed	3.00
Tygarty, Ky.—Washed, not dried	2.60
Utica, Ill.	1.75@2.50
Ableman, Wis.—Brass molding and molding fine	3.00
FOUNDRY SAND:	
Albany, N. Y.—	
Molding, fine and coarse	3.00@3.50
Brass molding	3.00@4.00
Core	2.00
Sand blast	6.00@8.00
Allentown, Pa.—Core	1.75@2.00
Molding coarse	1.75@2.00
Arenzville, Ill.—Molding fine	1.75@2.00
Beach City, Ohio—Core and glass sand	2.25@2.50
Furnace lining	2.50@3.00
Molding fine and coarse	2.25@2.50

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Ambridge, South Heights, Pa.		1.30		1.30	1.00	1.00
Attica, N. Y.	.75	.75	.75	1.00	1.00	1.00
Erie, Pa.		1.00	1.15		1.25	
Farmingdale, N. J.	.48	.48			1.40	
Hartford, Conn.	.90		1.25	1.15	1.15	1.15
Leeds Junction, Me.		.60@ .75	2.00	1.75	1.65	1.50
Ludlow, Mass.	.75*	.75*	1.70		1.50*	1.50*
Pittsburgh, Pa.		1.30@1.50			1.00	1.00
Washington, D. C.	.75	.75	2.00	1.40	1.20	1.20
York, Pa.		1.10@1.30	(crushed gravel)			
CENTRAL:						
Alton, Ill.	.60@ .75	.60@ .75	1.50@4.50	1.30	1.20	1.20
Attica and Covington, Ind.	.90	.90	.90	1.00	1.00	1.00
Barton, Wis.		.70	.80	.80	.80	.80
Chicago, Ill.		1.75@2.23	1.75@2.43			
Cincinnati, O., and vicinity	1.20	1.15	1.15	1.15	1.15	2.00
Columbus, O.		.80@1.25	1.10@1.25	80@1.25	80.@1.25	.80@1.25
Des Moines, Ia.	.75@1.00	.75	1.75	1.75	1.75	1.75
Detroit, Mich.	.65	.65	.95	.95	.95	.95
Earlestead (Flint), Mich.	.60	.70		1.05	.95	.95
Eau Claire, Wis.	.40@ .50	.50@ .60	1.00@1.25		1.00@1.10	
Elgin, Ill.		.80	1.00	.80	.80	.80
Elkhart Lake, Wis.		.75			.95	
Grand Rapids, Mich.		.60		.90	.85	.85
Greenville, Mechanicsburg, O.	.80	.70	.80	1.00	.85	.80
Humboldt, Ia.	1.00	.85	1.90	1.90	1.90	1.90
Indianapolis, Ind.	.60	.60		1.50	.75	.75
Janesville, Wis.		.65@ .95			.75@ .95	
Le Mars, and Doon, Ia.		.90		1.80		
Lincoln, Neb.	Sand .80, sand and gravel 1.30, drained for shipment					
Mason City, Ia.	.90	.80	1.90	1.80	1.70	1.65
Milwaukee, Wis.	1.55	1.55	1.60	1.60	1.60	1.60
Minneapolis, Minn.	.50	.50	2.00	2.00	1.75	1.50
Moline, Ill.	1.30	1.30	1.60	1.60	1.60	1.60
Pittsburgh, Pa.		1.30	1.30		1.00	1.00
Riton, Wis.		.85				.85@1.00
St. Louis, Mo., f. o. b. cars	1.95	1.65	1.85	1.65	1.60	1.60
Summit Grove, Clinton, Ind.	.85					1.00
Terre Haute, Ind.	1.00	1.00	1.25	1.25	1.25	1.25
Toledo, Ohio	.75	.75				
Yorkville, Moronts, Oregon and **Sheridan, Ill.**	.90	.90	.90	.90	.90	.85
SOUTHERN:						
Alexandria, La.		.90				1.65@1.85
Charleston, W. Va.		Sand 1.40@1.50—Gravel 1.50				
Flomaton, Ala.		1.00		2.25		
Ft. Worth, Tex.	2.00@2.25*	2.00@2.25*	2.75@3.00*	2.75@3.00*	2.75@3.00*	
Greenville, Miss.		1.10				1.00
Jedburg, Mo.		1.05	1.20@1.45	1.00	1.00	.95
Knoxville, Tenn.	1.15	1.15	1.60	1.60	1.60	1.40
Lake Weir, Fla.		.75				
Macon, Ga.		.75@1.00				
Memphis, Tenn.	1.40	1.40	1.50			1.50
N. Martinsville, W. Va.		1.40				1.20
New Orleans, La.	1.00		1.75		1.25	
Pelzer, S. C.	.90					
Pine Bluff, Ark.	1.25	.92	Washed gravel, all sizes, 2.10			
Tulsa, Okla.		.70				
Waco, Texas	.70@ .80	.70@ .80				
WESTERN:						
Denver, Colo.	.50*					
Grand Rapids, Wyo.	.50	.50	.85	.85	.80	.80
Kansas City, Mo.	(Kaw River sand, car lots, .75 per ton, Missouri River, .85)					
Niles, Calif.	1.00	1.00	.90@1.10	.85@1.00	.85@1.00	.85@1.00
Porteau, B. C.	1.30	1.30	1.30			1.20
Pueblo, Colo.	.95	.90				2.00
Roseburg, Ore.	2.00	1.75	2.00	1.75	1.75	1.75
San Diego, Calif.	.80@1.00	.80@1.00	1.30@1.60	1.25@1.55	1.25@1.45	1.10@1.40
San Francisco, Calif.		1.00	1.00@1.20	.85@1.00	.85@1.00	.85@1.00
Seattle, Wash.	1.25	1.25	2.00	1.25	1.25	1.25

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Boonville, N. Y.	.60@ .80		.55@ .75			1.00
Glenville, N. Y.				1.00*		
Hartford, Conn.		1.00*				
Yardville, N. J.		.50@ .75				
York, Pa.		1.00@1.30		(crushed rock sand)		
CENTRAL:						
Attica, Covington, Silverwood, Ind., and Palestine, Ill.	.75	.75	.75	.75	.75	.75
Cherokee, Hawarden, Ia.		.80 per ton—1.20 washed				
Elkhart Lake, Wis.		.90 per ton (washed concrete material)				
Ft. Jefferson, Mechanicsb'g, O.	.70	.60	.60			
Hersey, Mich.		.60	.60	.60	.60	
Janesville, Wis.		.65			.75	
Oxford, Mich.						.85@ .95
Saginaw, Mich., f. o. b. cars		.75	1.30	1.30	1.30	1.30
St. Louis, Mo., f. o. b. cars						1.75
Summit Grove, Ind.	.65	.65	.65	.65	.65	.65
Yorkville, Oregon, Moronts and Sheridan, Ill.						.80@ .90
SOUTHERN:						
Albany, Ga.	.70@1.00					
Dudley, Ky. (Crushed Sand)		1.15		1.10		
Lindsay, Tex.					.60	
Valde Rouge, La.						.60@ .75
Waco, Texas		.80		1.50		1.30
WESTERN:						
Saratoga, San Jose, Calif.		.60@ .75	.60@ .70	.60@ .70	.60@ .70	.60@ .70

*Cubic yard. B Bank. L Lake. || Ballast.

Crushed Slag

City or shipping point	Roofing	¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:							
Bethlehem and Emaus, Pa.	**2.50**	**.90**	**1.50**	**1.20**	**1.20**	**1.20**	**1.20**
Buffalo, N. Y.	2.35	1.35	1.35	1.35	1.10@1.35	1.35	1.35
E. Canaan, Conn.	3.50	1.10	1.10	1.35	1.25	1.25	1.25
Eastern Pennsylvania and Northern New Jersey	**2.50**	**.90**	**1.50**	**1.10@1.25**	**1.10@1.25**	**1.10@1.25**	**1.10@1.25**
Erie, Pa.	**2.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Emporium, Pa.	**2.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Hokendaugua and Donaghmore, Pa.	**2.50**	**.90**	**1.50**	**1.20**	**1.20**	**1.20**	**1.20**
Lebanon, Pa.	**2.50**	**.85**	**1.50**	**.85**	**.85**	**.85**	**.85**
Sharpsville and Struthers, Pa.	2.00	1.30	1.70	1.30	1.30	1.30	1.30
Western Pennsylvania	**2.50**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
CENTRAL:							
Chicago, Ill.			All sizes, $1.50, F. O. B. Chicago				
Detroit, Mich.			All sizes, 1.65, F. O. B. Detroit				
Ironton, Jackson, O.	**2.00**	**1.40**	**1.70**	**1.40**	**1.40**	**1.40**	**1.40**
Toledo, O.	2.20	1.70	1.95	1.95	1.95	1.70	1.70
Youngstown, Dover, Hubbard and Leetonia, O.	2.00	1.30	1.70	1.30	1.30	1.30	1.30
SOUTHERN:							
Alabama City, Ala.	2.05	1.00	1.25	1.25	1.25	1.00	.95
Ensley, Ala.	**2.05**	**1.00**	**1.25**	**1.25**	**1.25**	**1.00**	**.95**
Longdale, Goshen, Glen Wilton and Low Moor, Va.	**2.50**	**1.00**		**1.25**	**1.25**	**1.15**	**1.05**

Agricultural Lime and Hydrate

	—Agricultural Lime— Bulk	Bags	Per Cent CaO	Per Cent MgO	Agricultural Hydrate Bags
EASTERN:					
Adams, Mass.		7.50@8.00	72		
Bellefonte, Pa.	9.50		95.6		
Berkeley, R. I.			**50**	**18**	**15.00**
Branchton, Pa.		5.50			
Cassadaga, N. Y.—Marlime	**8.00**	**10.00**	**92.36**	**1.08**	
Cavetown, Md.	**8.50**				
Cedar Hollow, Devault, Rambo and Swedeland, Pa.	10.50		45.50	30.50	13.00
Chippewa, Pa.	6.00		78.67	1.33	
Farnams, Mass.	5.00	6.50	60	2	
Frederick, Md.	**7.75**		**88**	**5 to 8**	**10.50**
Grove, Md.	**8.00**				**10.75**
Highgate Springs, Vt.	**6.00**		**85**	**2**	**8.00**
Hyndman, Pa.	**5.00**	**8.50**	**80.23**	**2.87**	
Lime Ridge, Pa.	**5.25@6.50**		**80.56-62.56**	**3.87-1.75**	
Mt. Union, Pa.	**6.25**		**93.69**		
Newburgh, N. Y.			**57**	**38**	**8.00**
New Castle, Pa.	**3.50**	**4.50**	**47.6 to 50.4**	**0.62 to 1.12**	
Paxtang and Lemoyne, Pa.	5.00@6.00		60	3	
Rosendale, N. Y.	**8.00**	**9.00**	**92**	**5**	
Union Bridge, Md.	**11.00**	**5.50**	**73**	**1**	**13.00**
Williamsport, Pa.	6.25	12.00	84-87	2-3	12.00
West Rutland, Vt.	**5.00**	**8.00**	**68**	**3**	
West Stockbridge, Mass.	**3.35**	**5.35**			**12.00**
Williams and Blue Bell, Pa.		8.25	57	33	11.25
York, Pa.	9.50	13.00	92.5	3.5	11.75
CENTRAL:					
Alton and Hannibal, Ill.	11.50		.95		
Delaware, O.			**50.0**	**5-12**	**11.50**
Knowles and Valders, Wis.	5.00	9.00	55	45	12.50
Manistique, Mich.	**11.00**		**95**	**2**	**11.00**
Marblehead, O.			85.10	12.92	12.00
Mitchell, Ind.					12.50
Sheboygan, Wis.	**5.50**	**8.50**	**58**	**40.5**	
Woodville, Ohio			47.50	31.60	8.00@12.00
SOUTHERN:					
Blowers, Fla.	**5.50**		**98**		
Burns, Tenn.	9.50		96	0.54	12.00
Chippewa, Fla.	**5.00**		**80.0**	**15.0**	
Claremont, Va. (Marl.)	5.00	7.00	85-95	2-5	
Dittlinger, Texas		**9.00@11.00**	**98.62**	**0.29**	**12.50@15.00**
Erin, Tenn.	10.00		97.82	0.12	
Knoxville, Tenn.	10.00		98.4	1	13.00
Lushing, Va.	**9.00**	**11.25**	**60**	**15**	**12.75**
Maxwell, Va.	**6.50**		**84**		**6.50**
Newala, Ala.	**10.00**		**99.33**		
Ocala, Fla.	**4.00**	**6.00 pulv.**	**98½ (dry basis)**		
Staunton, Va.	8.00	10.50	85	10	
WESTERN:					
Colton, Calif.			**97**	**2**	**15.00**
Kirtland, N. Mex.	**12.00**				
San Francisco, Calif.		**15.00**	**97**	**0.33**	**15.00**
Tehachapi, Cal.	6.00	8.00	96	2	
Orofino, Idaho	**6.50**	**8.57**	**95**	**2.16**	

Miscellaneous Sands

(Continued from preceding page)

Bowmantown, Pa.—Core	1.35@1.50
Molding, coarse	1.80@2.00
Bridgeton, N. J.—Core	**2.00**
Cleveland, O.—Molding coarse	1.50@2.00
Brass molding	1.50@2.00
Molding fine	1.50@2.00
Core	**1.25@1.50**
Columbus, O.—Core	1.00@3.00
Brass molding	3.50@4.00
Glass sand	3.00
Molding fine and coarse	3.00
Conneaut, O.—Molding fine	**2.25@2.50**
Molding coarse	**2.00@2.25**
Delaware, N. J.—Molding fine	2.00
Molding, coarse	**1.90**
Brass Molding	**2.15**
Dresden, O.—Core	1.75
Molding fine and coarse	2.00
Brass molding	2.50
Eau Claire, Wis.—Core	1.00@1.25
Roofing gravel	1.00@1.25
Sand blast	3.00@4.25
Traction sand	.40@ .60
Fleetwood, Pa.—Furnace lining	**2.25**
Franklin, Pa.—Traction	**2.25**
Brass molding	**2.50**
Core	**3.00**
Molding fine	**3.00**
Molding coarse	**3.00**
Sand blast	**5.00**
Greenville, Ill.—Molding coarse	2.00@2.25
Hancock, Md.—Core and brass mldg.	**1.65**
Hellam, Pa.—Core	**2.00@2.50**
Joplin, Mo.—Stone sawing, flint	**1.25**
Kansas City, Mo.—Missouri River core	**.80**
Klondike and Gray Summit, Mo.—Molding fine	**2.00@3.00**
Mapleton, Pa.—Core, furnace lining, molding fine and coarse damp	**2.50**
Core, furnace lining, moulding, fine and coarse, dry	**3.00**
Massillon, O.—Molding fine	4.00
Core and molding, coarse	3.50
Glass sand	4.00
Traction	3.50
Furnace lining	**4.00**
Michigan City, Ind.—Core, bank	**.75**
Millington, Ill.—Glass and core	2.25
Core sand	2.25
Furnace lining	2.50
Roofing sand	2.25
Stone sawing	2.25
Mineral Ridge, O.—Core, molding, sand blast, roofing, etc., washed, screened (damp)	3.25
Montoursville, Pa.—Core and traction	1.50@2.00
Brass molding	1.75@2.25
Glass sand	2.00@2.75
New Lexington, O.—Molding fine	3.50
Molding coarse	3.25
Oregon, Ill.—Core, furnace lining, and glass sand	2.00@2.50
Sand blast and roofing sand	3.50
Ottawa, Ill.—Crude silica sand	1.25@1.75
Ottawa, Ill.—Core, furnace lining, steel molding	2.50
Sand blast	5.00
Glass sand	2.00@2.50
Roofing sand	2.50@5.00
Ridgeway, Pa.—Glass sand, green	2.25
Glass sand, wash	2.50
Molding, fine and coarse	1.20
St. Peter, Minn.—Glass sand	2.25
Core sand	2.25
Brass molding	2.25
Molding fine	2.25
Rockwood, Mich. — Glass sand, core, roofing, stone sawing	3.50@4.00
Sand blast	3.50@4.00
Thayer, Pa.—Traction	2.25
Furnace lining	1.40
Molding fine and coarse	1.25@1.50
Core, steel	2.50@3.00
Tygarty, Ky.—Core and stone sawing	2.60
Fire-brick sand, washed but not dried	2.15@2.40
Utica, Pa.—Core	3.00
Molding fine	3.00
Molding coarse, traction	3.00
Brass molding	3.00
Warwick, Ohio—Core, furnace lining, molding fine and coarse (dry)	2.75
Same, green	2.50
Wedron, Ill.—Core (crude silica)	1.25
Molding fine	1.50
Furnace lining	1.50
West Albany, N. Y.—Molding fine	2.50
Molding coarse	2.50
Brass molding	2.50
Zanesville, Ohio—Molding fine and brass	2.50@3.00
Molding coarse	2.25@2.50

Crushed Gypsum

Blue Rapids, Kan.—Crushed	4.00
Castalia, O.—Crushed, to cement mills	4.50
Ft. Dodge, Ia.—Bulk	4.00@5.00
Grand Rapids, Mich.—Crushed gypsum rock	4.00
Gypsumville, Man., Can.—Crushed	**3.50**
Oakfield, N. Y.	**4.00**
Gypsum, O., and Akron, N. Y.	**4.50@5.50**
Saltville, Va.	4.50

(Gypsum) Land Plaster

Castalia, O.—Land plaster	**6.00**
Bags extra—Jute, 3.00; ppr., 1.00.	
Garhutt, N. Y.—Land plaster, bags	7.50
Bags extra	
Grand Rapids, Mich.—Ground gypsum rock	5.00
Mound House, Nev.—Ground gypsum rock	7.50@8.00
Sacks, .25 extra	
Oakfield, N. Y.—Ground Gypsum rock	**8.00**
Plasterco, Tex.	12.00
Sandusky, O.	**6.00**
Jute, 3.00 extra; ppr., 1.00 extra.	
Los Angeles, Calif.	12.50

Ground Rock Phosphate

Centerville, Tenn.—B. P. L., 70%; ton, 2000 lbs. (90% thru 100 mesh)	**9.00@10.00**
Lump rock, 72% to 75%, B. P. L.	**6.00@8.50**
Centerville, Tenn.—B. P. L., 65%	**8.25**
B. P. L., 70%	**9.00@10.00**
Brown rock, 75% and better	**12.00**
Gordonsburg, Tenn.—2000 lbs. (90% thru 100 mesh)—B. P. L., 60%	**6.00**
B. P. L., 65%	7.50@9.50
B. P. L., 68%	700@8.00
B. P. L., 72%	9.50
B. P. L., 75%	12.00
Lump rock, long ton, 65-70%	**7.00@9.00**
Mt. Pleasant, Tenn.—(B. P. L. 68%)	
13% phosphorus	7.50@9.00
14% phosphorus	**8.00**
Mt. Pleasant, Tenn.—B. P. L., 70%	10.00
Norwills, Fla.—Fla. Hard Rock (B. P. L., 68%)	**10.00**
Wales, Tenn.—(B. P. L., 70%)	8.25

Florida Soft Phosphate

[illegible], Fla.—B. P. L., 60%, bulk	10.00
[illegible], Fla.—Ground pebble, 30%	16.00
Pulverized soft, 26%	17.50
Jacksonville (Fla.) District	10.00@12.00
(Add 2.50 for sacks)	
[illegible]ills, Fla.—B. P. L., 60%, bulk	10.00
[illegible]oslime, Fla. (in burlap bags)	15.00
[illegible]rriston, Fla. (24% phosphoric acid)	16.00
[illegible]kland, Fla. (N. B. P. L.)	13.50

Portland Cement

Current warehouse prices, carload lots at principal cities, without bags:

New York (del.)	$3.50
Jersey City (del.)	3.20
Boston	3.41
Chicago	2.37
Pittsburgh	2.42
Cleveland	2.73
Detroit	2.78
Indianapolis	2.61
Toledo	2.71
Milwaukee	2.59
Duluth	2.35
Peoria	2.63
Cedar Rapids	2.71
Davenport	2.67
St. Louis	3.45
San Francisco	3.09
New Orleans	4.20
Minneapolis	3.00
Denver	3.25
Kansas City	2.76
Seattle	3.03
Dallas	3.85
Atlanta	3.00
Cincinnati	3.32
Los Angeles	3.10
Baltimore (del.)	2.93
Montreal (including bags)	

NOTE—Bag charge is generally 25c each.

Natural Cement

Current price for 500 bbl. or over, f.o.b., exclusive of bags:

	Current
Minneapolis (Rosendale)	$1.85
Kansas City (Ft. Scott)	1.60
New Orleans	3.36
Atlanta (Magnolia)	1.90
Cincinnati (Louisville)	2.75
Boston (Rosendale)	2.35

Roofing Slate

The following prices are per square (100 sq. ft.) for slate, f. o. b. cars, quarries, Bangor, Penn.

No. 1 Clear Slate

Sizes	Price
24x14	10.85
24x12	10.85
22x12	11.55
22x11	11.55
20x12	11.55
20x10	12.60
18x12	11.90
18x10	12.60
18x 9	12.60
16x12	11.90
16x10	12.60
16x 9	12.60
16x 8	12.60
14x10	11.90
14x 8	11.90
14x 7	11.20
12x10	11.20
12x 8	11.20
12x 7	11.20
12x 6	11.20
10x 8	9.10
10x 7	9.10
10x 6	9.10

No. 2 Clear

24x12	8.75
22x11	8.75
20x10	9.45
18x10	9.45
18x 9	9.45
16x 8	9.10
14x10	9.10
14x 8	9.10

No. 1 Odd Sizes

18x18	13.30
16x16	13.30
14x14	13.30
12x12	13.30

The following are the prices per square for slate, f.o.b. cars quarries, Granville, N. Y., the prices given in each case being for No. 1 Sea Green Roofing Slate:

22x11, 20x12, 20x11, 20x10, 18x12, 18x10, 18x9, 16x12, 16x10	11.90
16x12, 16x10	11.90
24x12, 22x12, 16x9, 16x8, 14x12, 14x10	11.55
26x14, 24x14, 22x14, 20x14	11.20
14x9, 14x8, 12x10	10.50
14x7, 12x9, 12x8	9.80
12x7, 11x8, 11x7, 10x8	9.10
12x6, 10x7	8.40

Granulated slate per net ton, f. o. b. quarries, Vermont and New York, 7.50@12.00.

Lime

Warehouse prices, carload lots at principal cities.

	Hydrate per Ton	
	Finished	Common
New York	$21.00	$20.00
Kansas City	27.20	26.20
Chicago	20.00	.....
St. Louis	27.00	21.00
Boston	28.00	27.00
Dallas	.....	25.00
Cincinnati	18.20	17.20
San Francisco	25.40	22.00
Minneapolis	28.00 (white)	24.00
Denver	32.00	.....
Detroit	22.00	19.00
Seattle	27.00	.....
Los Angeles	2.75†	2.20†
Baltimore	24.00 (East)	.....
Montreal	25.00	25.00
Atlanta	.....	23.50
New Orleans	24.50	24.50

	Lump per 200-lb. Barrel	
	Finished	Common
New York	$ 3.80 at plant	$ 3.60*
Kansas City	2.50	2.40
Chicago	.....	1.65
St. Louis	.....	2.75
Boston	.....	3.95†
Dallas	.....	2.50†
Cincinnati	.....	2.10‡
San Francisco	.....	2.25
Minneapolis	2.10	1.80
Denver	1.05 (bu.)	.....
Detroit	2.00†	1.80†
Seattle	2.85†	.....
Los Angeles	2.75†	2.00†
Baltimore	.....	13.00‡
Montreal	15.00‡	15.00‡
Atlanta	3.00†	2.75†
New Orleans	3.00	2.85

*300-lb. barrels. †Per 180-lb. barrel. ‡Per ton.
NOTE—Refund of 10c per barrel with 25c per ton off on hydrated.

Talc

Prices given are per ton f. o. b. (in carload lots only) producing plant, or nearest shipping point.

Baltimore, Md.—Crude talc	4.00
Cubes	60.00
Blanks, per lb.	.08
Henry, Va.—Crude talc (lump mine run), per 2000-lb. ton	3.50
Ground talc (20-50 mesh), bags	8.75
Ground talc (150-200 mesh), bags	11.25@13.50
Chester, Vt. — Ground talc (150-200 mesh), bulk, 10.50@12.00; bags	12.00@14.00
Chatsworth, Ga.—Crude talc	8.00@10.00
Ground talc (150-200 mesh), bags	12.50
Pencils and steel workers' crayons, per gross	1.50@ 2.00
Rochester and East Granville, Vt.— Ground talc (20-50 mesh), bulk	8.50@10.00
(Bags extra)	
Ground talc (150-200 mesh), bulk	10.00@22.00
(Bags extra)	
Waterbury, Vt.—Ground talc (20-50 mesh), bulk	8.50
(Bags extra)	
Ground talc (150-200 mesh), bulk, 10@15.00 and	10.00@15.00
(Bags extra)	
Pencils and steel workers' crayons, per gross	2.00
Biltmore, N. C.—Ground talc (150-200 mesh), 200-lb. bags	15.00@30.00
Pencils and steel workers' crayons, per gross, 1.25@1.45 and	1.55@ 1.60
School crayons, per gross	1.15@ 1.20
Roller mill crayons, per gross	1.75@ 1.90
Keeler, Calif.—Ground talc (150-200 mesh), bags	18.00@40.00
(Bags extra)	
Gouverneur, N. Y.—Crude talc	4.25
Ground talc (150-300 mesh)	17.00@24.00
Johnson, Vt.—Ground talc (20-50 mesh), bulk	8.50@10.00
(Bags extra)	
Ground talc (150-200 mesh), bulk	10.00@21.00
(Bags extra)	
Los Angeles, Calif.—Ground talc (20-50 mesh) 200-lb. bags	12.00
Ground talc (150-200 mesh) 200-lb. bags	20.00
Natural Bridge, N. Y.—Ground talc (150-200 mesh) bags	16.00@20.00

Sand-Lime Brick

Prices given per 1,000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Michigan City, Ind.	14.00
Milwaukee, Wis. (delivered at job)	18.50
Barton, Wis.	15.00
South Dayton, Ohio	16.50
Albany, Ga.	16.00
Brighton, N. Y.	20.50
Buffalo, N. Y.	16.50
Winnipeg, Can. (less $1 trade disc.)	19.00
Boston, Mass.	19.00
Syracuse, N. Y. (delivered at job)	27.00
F. o. b. cars, plant	25.50
Washington, D. C.	15.50
San Antonio, Texas—Common	20.00
Face	25.00@32.00
Boise, Idaho (in yard)	18.00
El Paso, Texas	15.00
Rochester, Mich.	13.00
Bloomfield, Ont., Can.	18.00
Plant City, Fla.	17.00
Grand Rapids, Mich.	15.00
Lancaster, N. Y.	16.50
Portage, Wis.—Common	18.00@20.00
Face	30.00@35.00
Toronto, Can.	17.00
Saginaw, Mich.	17.00

New Cypsum Plant at Laramie, Wyo.

A NEW plaster mill that promises to develop into one of the most modern in the United States is now in the process of erection at Laramie, Wyo., by the Laramie Cement Plaster Co., a newly-organized corporation capitalized at $250,000. The deposit owned by this company is located on a 160-acre tract of land containing 55 acres of gypsite, averaging from 11 to 18 ft. in depth, and of excellent character.

The contract for the machinery and the design of the plant was let to the J. B. Ehrsam Co., of Enterprise, Kan., who will equip the new mill with the latest and most modern machinery.

The company has its main office located at Laramie and is headed by Chas. L. Patchell, president; Wm. McCune, vice-president; C. D. Spalding, treasurer, and B. F. Bickel, superintendent.

Further Reductions in Refractory Brick

PRICES of refractory brick, for lining lime and cement kilns, were given another cut on Jan. 17. Prices announced in the Pittsburgh, Pa., district, f.o.b. plant now are:

Fire Clay—	High Duty	Moderate Duty
Pennsylvania	$40.00 to $50.00	$35.00 to $40.00
Ohio	40.00 to 45.00	30.00 to 35.00
Kentucky	40.00 to 45.00	35.00 to 40.00
Illinois	40.00 to 50.00	30.00 to 40.00
Missouri	50.00 to 55.00	35.00 to 45.00
Silica Brick—		
Pennsylvania		45.00 to 50.00
Chicago		55.00
Birmingham		56.00 to 60.00
Magnesite Brick—		
Standard size, per net ton		100.00
Chrome Brick—		
Standard size, per net ton		80.00 to 90.00
Bauxite Brick—		
55 per cent per net ton		40.00
76 per cent per net ton		85.00

General Market News

Big Lime and Stone Merger in Wisconsin

THE WESTERN LIME AND CEMENT CO., a new Milwaukee corporation with a capital stock of $1,000,000 has absorbed the Nast Brothers Lime and Stone Co., at Marblehead. Subsidiary companies of the Nast Brothers at Knowles and Kewaunee, Wis., are included in the merger.

The deal makes the Western Lime and Cement Co. one of the largest operators in the lime business in the State of Wisconsin.

Prior to the merger with the Nast Brothers Co., the Milwaukee concern was known as Western Lime and Cement Co., and operated quarries at Hamilton, adjacent to the Nast Co. plant, a quarry and lime kiln at Grimms, Brillion, Sherwood, Hayton, and a stone crushing plant at Greenleaf. With the reorganization and merger the word "the" was added to the name.

W. F. Nast, who was active in the management, becomes secretary of the new corporation. While not officially confirmed, it is understood that George Nast will be named general plant manager of the new Western Lime and Cement Co.

The three Nast plants will continue to operate as before. The Marblehead plant was established in 1880. The new combination became effective January 1.

Missouri Gravel Men Organize Traffic Department

THE MISSOURI Valley Association of Sand and Gravel Producers has added a traffic department to its organization.

The work of this department will be carried on under the direction of E. H. Hogueland, traffic attorney of Topeka, Kas. Mr. Hogueland has specialized in handling rate cases before state and government commissions and has represented numerous industries in this part of the country. He is a traffic man of long experience and well qualified to handle the Association's problems.

Assisting Mr. Hogueland and actively engaged in the work of the department will be H. E. Woolverton, who comes to the Association with seven years' traffic experience. Mr. Woolverton was for some years with the Santa Fe R. R. and later represented different shippers' organizations in Kansas and Missouri. He is now assembling a complete tariff file and preparing to receive the traffic troubles of the individual members.

Production at a Standstill in Lehigh Valley Cement District

THERE IS LITTLE change in the production situation in the Lehigh Valley cement district of Pennsylvania. The different mills have curtailed operations to a low point and practically the only company engaging in the Northampton section is the Atlas Portland Cement Co., which is working about one-half of its kilns. Other companies are keeping just a few departments going, to be ready for a resumption of manufacture as soon as conditions warrant, as well as to supply the small, immediate demands. Storehouses are practically empty and there does not seem to be any inclination to "stock up" at the present time at the different plants. This is evidently due to lack of faith in market stability and indicates that price declines are anticipated before any marked call.

In this latter connection the price of cement has again declined in the New York market, as intimated in the last issue of ROCK PRODUCTS, the present quotation being $4.50 a barrel, or $3.50, less bags, as against $3.80 early in January. Nearby cities are adopting a similar trend, and Philadelphia, Pa., dealers are meeting the new figures. At Boston, Mass., the price holds at $5.50 a barrel with bags, for which $1.00 rebate is allowed, while in paper containers, local dealers are asking $4.90. At Providence, R. I., a quotation of $5.60 is being made, with a total bag credit of 90 cents for four bags. At these different levels there is no market that shows any degree of firmness, and New England prices, as a whole, appear nearly ready for a drop. At New York it is likely that present figures will hold for several weeks.

Following price decline in the material markets, producers in the Lehigh Valley section are arranging for wage reductions, and several have already been placed into effect. At Coplay the Lehigh Portland Cement Co. and the Coplay Cement Mfg. Co. have announced a reduced wage schedule among skilled workmen, piece workers and laborers. The Lehigh mills have reduced the wages for common labor from 47½ to 35 cents an hour, with proportionate recession in schedules for the skilled operatives. Laborers at the Coplay mills have been reduced 9 cents an hour, while piece workers and other employes have been reduced from 15 to 20 per cent. Other mills in this district are expected to announce revised schedules at an early date.

New York Hearing on Sand and Gravel Rates

REPRESENTATIVES of various New York State steam railroads and highway building interests attended a hearing before Chairman Charles B. Hill of the Public Service Commission of New York recently, relative to the 40 per cent increase in freight rates for carload shipments of sand, gravel, rock, crushed stone and slag, authorized by the Interstate Commerce Commission, but suspended within the state by the Public Service Commission. It was stated by M. B. Pierce, New York, representing the railroads; W. L. Sporborg of Syracuse, the complainants, and F. W. Brown, the State Highway Commission, that a conference had been held between the parties and further conference was desired. A requested adjournment until January 26 was granted by Chairman Hill and another conference will follow. If no satisfactory adjustment is reached by the adjourned date, the railroads will then present their evidence in support of the 40 per cent increase. It is understood that the shippers have submitted a proposal calling for a 10 per cent increase.

International Cement Corporation Gains

INTERNATIONAL CEMENT CORPORATION, 347 Madison St., New York City, reports for the quarter ended September 30 show a surplus of $654,101, compared with $547,591 in the second quarter and $225,346 for the first quarter, or a total of $1,427,038 for the first nine months of 1920.

Rules for Phosphate Leases Are Approved

SECRETARY PAYNE, Department of the Interior, has approved rules and regulations for leasing of phosphate deposits in the public lands. About 2,500,000 acres of lands in Wyoming, Idaho, Utah and Montana have been withdrawn from disposition for a number of years awaiting legislation recently enacted by Congress. These regulations will open them to lease in areas not exceeding 2560 acres each and should add largely to the fertilizer supply of the United States, phosphate forming an important ingredient in commercial fertilizers. Application for leases are to be filed with the local land offices for transmission to the Secretary of the Interior, and printed copies of the rules and regulations will be available to those offices and to the public as soon as printed.

General Market News

New Cement Merger

THE ALPHA PORTLAND CEMENT CO. has purchased the plants and business of the Burt Portland Cement Co., at Bellevue, Mich.; the Ironton Portland Cement Co., at Ironton, O., and the La Salle Cement Co., at La Salle, Ill. C. A. Irvin has been elected a vice-president, and will have charge of the Alpha interests in the territory formerly served by these companies, with headquarters in Chicago.

Virginia Gypsum Producer Urges Protective Tariff

Established in 1906, when a favorable tariff was in effect, the Southern Gypsum Co., Inc., of North Holston, Va., cannot today compete with the imported gypsum, declared E. G. West, because of higher costs of mining and higher freight rates. The duty now, he told the Committee on Ways and Means of the U. S. House of Representatives, is "very light" and he suggested a duty of 50 cents a ton, which would give a substantial return to the government and at the same time give some protection to the gypsum industry in the United States and to Virginia in particular. This was the duty that formerly prevailed.

The House Committee on Ways and Means was urged to place raw gypsum on the free list by Joseph C. Seguine of New York, who represented the importers. Mr. Seguine pointed out that all the raw gypsum imported comes from Canada, and is not, therefore, subject to the low production costs due to small wages paid to labor in other foreign countries, and the American producer is on a plane with the Canadian producer in that respect.

To support his plea for free importation of raw gypsum, Mr. Seguine submitted the following reasons:

The territory at and adjacent to the Atlantic seaboard should have the full benefit of its relative nearness to the Nova Scotia quarries.

Nova Scotia and New Brunswick afford one of the three possible sources of supply of raw gypsum for manufacturing plants east of the Allegheny Mountains.

All the manufacturing plants located on the Atlantic seacoast are those at or in the vicinity of New York City. These plants are solely dependent upon the Canadian source of supply for their raw gypsum.

American capital developed and still owns the Canadian source of supply of raw gypsum.

American capital developed and still owns the American mills in which the raw gypsum is manufactured.

Two-thirds of the raw gypsum imported is carried by a fleet of boats used exclusively for this purpose, and owned and operated by American capital.

The American capital invested in the Canadian quarries, the transportation system and the manufacturing plants in the United States should be protected by being given the advantage of a lowered cost of raw gypsum.

Sixteen per cent of the weight of the raw gypsum (upon which duty and freight are now paid) is lost in the process of manufacture.

Free raw gypsum would not work a hardship upon users of domestic raw gypsum because (a) of ocean freights from source of supply to manufacturing plants, (b) distribution from producing points is economically controlled by rail freight rates to consumers.

Gravel Men of New York Fined $40,000

THE FOUR SAND and gravel firms and 11 individuals who pleaded guilty to violating the Sherman anti-trust law before Judge Hand in the Federal Court, Manhattan, New York, were fined $40,000 collectively.

The fines are the first penalties inflicted by a Federal court on producers and dealers of building material and resulted from indictments found Dec. 29, based on information obtained by the Lockwood Committee's investigation.

Judge Hand also signed a decree dissolving the Sand and Gravel Dealers' Board of Trade, an organization formed by the defendants.

A fine of $5000 was imposed upon each of the following companies:

The Goodwin-Gallagher Sand & Gravel Corporation.

The Manhattan Sand Co., Inc.

The Lenox Sand & Gravel Co., Inc.

The Colonial Sand & Gravel Co., Inc.

The following defendants were also fined:

John J. Gallagher, vice president of the Goodwin-Gallagher Corp., $2000; Peter C. Gallagher, treasurer, $4000; Frank F. Gallagher, secretary, $3000.

Joseph Gallagher, secretary-treasurer of the Manhattan Sand Co., $1000; Frank Rowsey, manager, $1500.

William J. Mahoney, president of the Lenox Sand & Gravel Co., $1500; Richard A. Scanlan, secretary, $1000.

Eugene P. Clark, executive secretary of the Sand & Gravel Dealers' Board of Trade, $2000.

Lawrence Rukeyser, president of the Colonial Sand & Stone Co., $1500.

Thomas Lanigan and Martin Lanigan, members of the firm of Lanigan Bros., sand dealers, $1500 and $1000, respectively.

Railroad Bribery Denounced by Interstate Commerce Commission

BRIBERY as a method of obtaining preferred treatment in the distribution of freight cars is condemned in the annual report of the Interstate Commerce Commission, issued in December.

The commission is continuing its investigation of the practice and furnishing the Department of Justice with any evidence of illegal dealings, so that prosecution may be instituted. Evidence given in many industries was to the effect that shippers were freely using money to obtain cars during congested periods on the railroads. The railroad companies and the National Industrial Traffic League are working to prevent this corruption.

The commission, however, asks Congress for additional legislation to more effectually meet the situation. Its statement follows in part:

"As a result of the inadequacy of the car supply and of railroad transportation facilities generally during the past year, a practice has grown up among shippers of bribing operating employes of railroad companies in order to obtain transportation services.

"The demoralizing effects of this practice are far reaching. Bribery of this character in many instances cannot be directly and effectively reached under existing laws. It is therefore recommended that the Interstate Commerce Act be amended to provide for the punishment of any person offering or giving an employe of a carrier subject to the act any money or thing of value with intent to influence his action or decision with respect to car service as defined in the act, or because of such action or decision; and to provide also for the punishment of the guilty employe."

Freight Reductions on Road Materials in Missouri

AN ORDER issued by the Public Service Commission of Missouri on Jan. 18 favors road building, and effective Feb. 15 the commission directs the railroads to transport at a rate of 1 cent a ton per mile for all hauls under 400 miles on all crushed rock, sand, gravel and clay.

The order requires that all shipments under this rate of the materials named must be made to someone either officially connected with the state or county road-building authorities.

The matter was taken up on the commission's initiative several months ago. The maximum of 400 miles will cover all road shipments in this state.

News of the Industry

Incorporations

Empire Asbestos Mine Co., Wilmington, Del., has been incorporated for $500,000.

Wilbur Lumber Co., Milwaukee, Wis., has increased its capitalization from $500,000 to $1,000,000.

The Casco Gravel Co., Green Bay, Wis., has increased its capitalization by $10,000 making a total authorized capital of $28,200.

The Cerulean Stone Co., Henderson, Ky., has been incorporated for $72,000 by J. L. Nicholson, A. M. Andrews and Ben E. Miles.

D. and P. Roofing Tile Co., 44 Polk St., Guttenberg, N. Y., has been incorporated for $125,000 to manufacture roofing materials.

Badger Sand and Gravel Co., Milwaukee, Wis., has been incorporated for $10,000 by J. D. McCarthy, N. McCarthy and W. T. Sullivan.

Prestone Products Corp., West Allis, Wis., has been incorporated for $15,000 to manufacture and deal in all building materials and ornamentations.

Eastern States Sand and Gravel Corp., Manhattan, N. Y., has been incorporated for $500,000 by J. Constantine, 107 Broad St., New York City.

Van Doesalaer Co., Sheyboygan, Wis., has increased its capitalization from $5,000 to $13,000. The company engages in cement and concrete work.

The Crown Sidewalk & Block Co., Minneapolis, Minn., has been incorporated with a capital of $50,000, to deal in sand, gravel and building materials.

The Tobey Lime Co., West Stockbridge, Mass., has been incorporated for 50,000 by M. H. Deeley, Pres.; J. M. Deely, Vice-Pres., and M. S. Deely, Treas.

The Lynn Stone Co., Lynn, Mass., has been incorporated for $10,000 by V. A. Scagliotti, Pres.; A. W. Zanetti, Everett, Treas. and J. J. Doherty.

The New Jersey Cement Products and Construction Co., Dover, N. J., has been incorporated for $100,000 to manufacture and deal in bricks, tile, etc.

Troy Development Co., Royal Oak, Mich., has been incorporated for $40,000 for the purpose of purchasing, holding and dealing in sand, gravel and real estate.

Superior Sand and Gravel Corp., New York City, has been incorporated for $3,025,000 by H. C. Whortman, L. G. Keplinger and A. B. Busch, all of New York City.

Cedarburg Supply Co., Cedarburg, Wis., has been incorporated for $15,000 to deal in all building materials by Chas. Pollow, Ed. Pipkorn, and M. Lennartz, all of Cedarburg.

The Interlocking Cast Stone Co., Elizabeth, Pa., has been incorporated for $25,000 to deal in construction materials by J. Gotti, Michael Feid and Ed. J. Ludwig, all of Elizabeth.

The Massachusetts Minerals Corp., Springfield, Mass., has been incorporated for $50,000 by Wm. J. Granfield, Pres.; F. T. Nicholl, Treas. and N. P. Decoteau, all of Springfield.

The Wyoming Mica Mining and Milling Co., Laramie, Wyo., has been incorporated for $300,000 by H. E. McBroom, Louis Porter, Schuyler Porter, Frank McBroom and A. Z. Stewart.

The Anderson Granite Co., Morton, Minn., has been incorporated with a capital stock of $100,000 to quarry granite. J. W. Anderson of Morton and F. E. Sylvester of Olivia, Minn., are the incorporators.

Novelli and Calcagni, Inc., Montpelier, Vt., has been incorporated for $100,000 to do a general granite monumental business by J. C. Calcagni, W. A. Murray, C. M. Calcagni, and T. Calcagni, all of Barre, Vt.

The Granite Mountain Crushing Co., St. Paul, Minn., has been incorporated for $200,000 to quarry and crush rock by M. E. Brooks and Kay Todd, both of St. Paul; T. F. Spreiter, St. Paul, and M. O. Shoop of Minneapolis.

The Metro Cast Stone and Construction Co., Manhattan, N. Y., has been incorporated for $500,000 to make and deal in building materials by A. A. Deutsch, H. Margoshes and N. Katz, 215 Chester St., Brooklyn, N. Y.

The Ula White Way Post Co., Tampa, Fla., has been incorporated with a capital of $50,000, to manufacture concrete posts. Wm. G. Fulton is president and manager; R. S. Gerry, vice-president; E. F. Clifford, secretary and treasurer.

The Albany Limestone Co., Albany, Ind., has been incorporated for $15,000 by G. McGinley, C. A. Burdick and A. W. Lockhart.

The Saukville Concrete Products Co., Saukville, Wis., has been incorporated for $30,000 to manufacture and deal in concrete building blocks by M. J. Schmit, Washington, Wis.; Wm. M. Schmit and O. J. Grady, both of Saukville, Wis.

The Milwaukee Cement Co., Milwaukee, Wis., has decreased its capitalization from $350,000 to $196,000. This company handles all building materials. Howard Greene, First Wis. Nat'l Bank Bldg., Milwaukee, is president and W. T. Berthelet, secretary of the company.

The Ford Roofing Products Co., Chicago, Ill., through E. R. Litsinger, its vice-president and treasurer, announces the increase of its capital stock from $1,000,000 to $3,500,000. The company's output during 1920 was double that of 1919. With the resumption of building operations, which must come on account of the shortage of over a million homes in the United States, the company expects in 1921 to again double its business in 1921 over the preceding year. In anticipation of this increase, the company has increased its working capital and its manufacturing facilities.

Sand and Gravel

The Southern Silica Mining & Mfg. Co., Columbus, S. C., of which H. E. Wells is secretary, has increased its capital stock from $10,000 to $30,000, and will purchase additional sand pits.

Springfield, Ill.—The name of the Vriginia Timber Co. of this city, has been changed to the Springfield-Pekin Sand and Gravel Co. and its capitalization has been increased from $25,000 to $100,000.

The American Sand and Gravel Co., Chicago, Ill., has let a contract to the Manitowoc Shipbuilding Corp., Manitowoc, Wis., for the erection of a 212 ft. steel sand sucker. Coincident with the awarding of the contract announcement was made of the consolidation of the Hydraulic Sand & Gravel Co., and the American Sand & Gravel Co.

The Del Monte Properties Co., Del Monte, Calif., is constructing a modern sand washing and drying plant just outside of Pacific Grove on the famous 17-mile scenic drive. The sand found on the Monterey peninsula has great commercial value. Upwards of $100,000 has been invested in the plant. The Del Monte white sand is used for fine construction work as well as in the manufacture of glass.

Ottawa, Ill.—Re-opening of the Miller plant of the United States Silica Co. in South Ottawa, and construction of a new plant at a cost of $500,000 during 1921 are in prospect as a result of the purchase of the Miller plant and 60 acres of land on the farm of Charles Peck and Robert Iliff by H. W. Belrose, well-known Ottawa man, who has played a prominent part in the development of the silica sand industry in Ottawa. The purchase of the U. S. Silica plant and property includes 65 acres of land, which makes a total area of 125 acres. The deal, announcement of which has just been made by Mr. Belrose, represents $125,000.

Greenville, O.—The annual meeting of the plant managers of the Greenville Gravel Co. and allied interests was held in Greenville, O., on Jan. 8 and 9. For a number of years it has been the custom of the company to call together its plant managers and office men for an exchange of views and discussion of policies relating to the affairs of the company. Thirty-six members of the company were present at the meeting. The company's interests include the Greenville Gravel Co., the Kalamazoo-Greenville Gravel Co., the Detroit-Greenville Gravel Co., the Richmond-Greenville Gravel Co., the Arkansas Gravel Co., the Greenville Mfg. Co., and the Allied Belting Co. In addition to the plan managers and office men of the company, C. A. Papuette, of Cincinnati chief engineer of the Big Four railway; T. J. Walsh, Davenport, Ia., president of the Walsh Construction Co., and M. E. White, of Chicago, president of the White Construction Co., were also guests of the company and delivered interesting talks to the assembly.

Quarries

The Union Stone Co., Mount Wolf, Pa., has adopted a three-day week operating schedule at its plant until further notice. A reduction in wage scale has been made from 40 to 35 cents an hour.

The Southland Marble & Granite Co., Marietta, Ga., is in the market for a pneumatic air or motor driven marble polishing machine.

The Delaware Quarry and Construction Co., Atlanta City, N. J., suffered a fire recently, causing damages amounting to $100,000.

The Michigan Verde Antique Marble Co. has let the contract for the construction of several buildings at its plant north of Ishpeming, Mich.

The Wausau Quarry Co., Wausau, Wis., has filed articles of dissolution. This company was incorporated Feb. 3, 1900, for $35,000 to mine and crush quartz rock. P. W. Sawyer was president and R. E. Chartier, secretary.

The Consolidated Construction Co., Newburyport, Mass., is arranging for the early construction of a new stone crushing plant with a capacity of about 5000 tons of material per day. The new plant is estimated to cost about $400,000, including machinery. Contracts for certain equipment have been let. W. L. Alexander, 41 Pleasant Street, is in charge.

Madisonville, Ky.—It is understood a number of local men will organize a company for the purpose of crushing rock in Hopkins county and that the capital stock of the company will be $25,000. The rock crushed will be used on the roads of the county. Rock crushing machinery will be purchased and details of the company will be announced in a short time.

The Berkshire Stone Corp., South Egremont, Mass., is building a new half million dollar plant for the purpose of engaging in varied quarry enterprises such as the production of marble blocks, fluxing stone, crushed stone, lime and sawed marble. This company was but recently incorporated for $500,000 under the laws of the state of Massachusetts and has been getting out a monthly promotional bulletin called the "Bershire Stone Tablet." In this bulletin, the company publishes information concerning their holdings and progress made in the development of the new plant and quarries. It is made up in a very attractive manner and contains much useful information. The company is now ready to install a No. 5 Telsmith gyratory crusher for their quarry at South Egremont. It will have a capacity of from 25 to 40 tons an hour. A part of the installation is a Telsmith heavy duty screen 140 in by 14 ft. The output of the crushing plant will be sold as fluxing stone for steel plants, and the small particles or fines will be sold under the trade term of "aggregate" to makers of cast stone work.

Cement

The Oklahoma Portland Cement Co., of Ada, Okla., is enlarging its plant and will install a 240-ft. kiln.

The Atlas Portland Cement Co., Philadelphia, Penn., has increased its capitalization from $13,700,000 to $19,200,000.

Sarnia Cement Products, Ltd., Point Edward, Ont., has been incorporated with a capital of $100,000 to manufacture portland cement.

The Western States Portland Cement Co., with headquarters at Independence, Kan., has already purchased 150 acres of land in the vicinity of Nutting station, on the C., D. & M. R. R., six miles above Davenport, Ia., as a plant site. When the building has been completed it will represent an investment of about $1,500,000. Ninety acres of this land lies north of the River road, and was purchased for the shale deposits which were found in the hills. The balance of the tract extends from Nutting station to Iowana station, and from the River road to the Mississippi river. All of this latter portion is underlaid with a high grade of cement rock, with an average of but six feet of clay and soil overlying the rock. Nearly 400 acres of this land will be available for the purpose of quarrying rock. The rock has been prospected to a depth of 120 feet. Geological records lead to the conclusion that a depth of 400 feet of rock may be expected in this locality. The ground which will be occupied by buildings and yard tracks comprises 30 acres of land lying north of the C., D. & M. and the D., R. I. & N. W. railways, and extends from Nutting station to the east, and along the north side of this ground will be opened the rock quarry. The mill building proper will occupy ground about 200 ft. wide by 500 ft. long. There will be erected four cylindrical kilns each 220 ft. long.

The **Empire Cement & Limestone Co.**, Portland, Ga., of which L. D. Oglesby is general manager, will increase its capacity to 1500 barrels.

The **Texas Portland Cement Co.**, Dallas, Tex., will install an 8x9x220-ft. kiln and correspondingly increase the raw material machinery. J. A. Wheeler is vice-president and treasurer.

The **Dewey Portland Cement Co.**, Dewey, Okla., closed its plant at Dewey on Jan. 18 for repairs which are expected to occupy at least two months' time. This action will affect many of the workers there who will be idle during this time. The bins are filled with cement and it is estimated that there is enough to run the plant for two or three months.

Bridgeport, Ala.—After an idleness extending over a period of several weeks, the Dixie Portland Cement plant near Bridgeport, Ala., one of the largest plants of its kind in this section of the Southeast, has resumed operations. Business conditions are much improved and officials of the plant are confident that the normal stage will return within the next 60 or 90 days. Several hundred men are employed at the plant which is operating on a full time schedule with no reduction in wages.

Phosphate

The **Midwest Chemical Co.**, Nashville, Tenn., recently organized, is planning for extensive development of phosphate lands, lately acquired. The tract totals about 450 acres. Considerable machinery and operating equipment will be installed in the new works. Ellis Soper, 402 Independent Life Building, is president and engineer.

The **Western Phosphate Co.**, Salt Lake City, Utah, has been adjudged bankrupt and H. Van Dam, Jr., was appointed receiver. It is stated that the general offices of the company are located in Salt Lake and its mine property in Idaho. The Western Powder Co. claims an indebtedness of $4,187; the Hercules Powder Co., $799, and the Wade-Williams Engineering Co., $176. Officials of the Western Phosphate Co. who are located in Salt Lake, are: E. O. J. Hanke, vice-president, and S. K. Keelock, secretary-treasurer.

Gypsum Products

The **Laramie Cement Plaster Co.**, Laramie, Wyo., announce through their president, C. L. Patchell that work on the remodeling of the cement mill, recently purchased, is going on nicely and the company hopes within a short time to have the building ready to install their machinery. Considerable interest has been aroused in this new enterprise and a large amount of stock has been purchased by local people. For the benefit of those who contemplate purchasing stock Mr. Patchell stated that the price on same will undoubtedly be increased very shortly and that intending purchasers should arrange for their stock at once, as there is some likelihood that the stock may be withdrawn from the market.

J. B. King & Co., New York, N. Y., manufacturers of plaster, etc., have increased their capital from $600,000 to $3,000,000.

The **Victor Plaster Co.**, Rochester, N. Y., has been organized with a capital of $287,500 to manufacture plaster and kindred building materials. The company is headed by A. H. Dewey, C. A. Huber and G. A. Jackson, all of Rochester.

Concrete Products

The **Wausau Mfg. Co.**, Wausau, Wis., manufacturers of cement block, has increased its capitalization from $50,000 to $75,000.

Ontario Production Co., manufacturers of concrete blocks, sewer pipe, tile and brick have moved to Barrie, Ont., from Toronto.

John J. Kelley is establishing a plant in Fort Lauderdale, Fla., for the manufacture of cement blocks.

Architectural Cast Stone Co., Manhattan, N. Y., has increased its capitalization from $2,500 to $25,000.

The Stark Mantel and Tile Co., Milwaukee, Wis., has increased its capitalization from $10,000 to $30,000. W. B. Stark is president of the company and C. B. Stark, secretary.

The Roanoke Cement Tiling & Roofing Co., Roanoke, Va., is planning for the rebuilding of the portion of its plant recently destroyed by fire with loss reported at close to $12,000.

The National Concrete Materials Co., Luverne, Minn., of which R. W. Miller is secretary, has purchased a site in Sioux Falls, S. D., and will establish its main office there. They also contemplate building a sand and gravel plant, and later a concrete tile plant on a site 2½ miles west of that city.

The Petros Mfg. Co., St. Petersburg, Fla., has plans under way for the establishment of a local plant for the manufacture of cement and concrete building materials, including blocks and other products. Cement molds and general concrete mixing and manufacturing machinery will be installed. D. G. Zeigler is manager.

The Core Joint Concrete Pipe Co., 1802 Whitmore Ave., Baltimore, Md., has been reorganized with Samuel A. Ver Valen, president, also president of Hudson Cement & Supply Co.; Wilson P. Foss, New York City, formerly president of the New York Trap Rock Co., first vice-president; Louis R. Rafetto, president of Bath Portland Cement Co., second vice-president; George H. Haines, Baltimore, Md., secretary and treasurer, and A. J. Boyle, Baltimore, Md., general manager. The company takes contracts anywhere in the United States, Canada and Cuba for reinforced pipe lines from 24 inches to 120 inches in diameter for sewerage, drainage, gravity lines, conduits, pressure pipe lines, water conduits, intakes, etc.

The Earl R. Maltby Co., Endicott Square, Buffalo, N. Y., is having plans prepared for the erection of its proposed new plant on the Walck Road, North Tonawanda, N. Y., for the manufacture of asphalt shingles and other roofing products of gypsum nature. The company recently acquired a site at this location, and the initial works will be one-story, 100 by 300 ft. The plant will give employment to about 50 men for first operations. It is proposed to commence construction at an early date.

Evansville, Ind.—One thousand waterproof building blocks a day will be the output of the newly-organized Tekoppel Block Co. of this city, according to the statement of J. H. Tekoppel, who has been in the concrete and cement business in Evansville for twenty-two years and who is said to have been the first man in this city to have manufactured building blocks. The new concern is capitalized at $50,000. The officers are J. H. Tekoppel, Pres.; F. J. Folz, secretary, and Tobias Thayer, Vice-Pres., and general manager.

The American Cement Tile Co., Pittsburgh, Pa., with southern office in the Brown-Marx Building, Birmingham, Ala., has acquired about 3 acres of property in this vicinity, improved with two buildings. The structures will be remodeled and improved, and a number of new extensions will be built, to provide for a plant for the manufacture of high grade cement tile, with annual output of close to 1,000,000 square feet. The company has been operating a temporary plant at Fairfield, near Birmingham, and this factory will be removed to the new location. T. W. Barnes is local manager for the company.

Retail Dealers

Cement Products Co., New Bedford, Mass., has been incorporated by J. J. McGinty and John F. Abbott.

The Builders Lumber and Supply Co., Wausau, Wis., has increased its capitalization from $25,000 to $50,000.

The Clifton Builders Supply Co., Clifton, N. J., has increased its capital from $25,000 to $100,000 for proposed expansion.

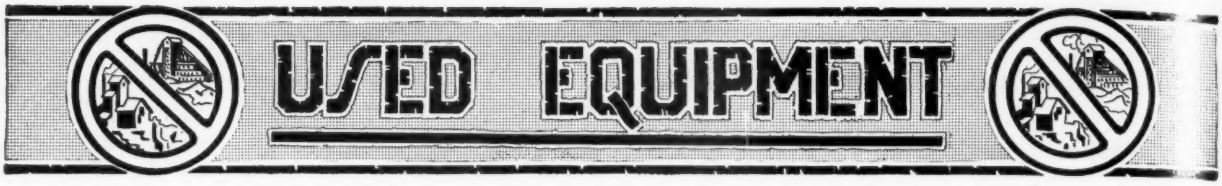
The Noonan Building Material Co., has increased its capitalization from $25,000 to $100,000 for proposed expansion.

The Pennsylvania Supply Co. has been organized with a capital of $50,000, in Detroit, Mich., to handle builders' supplies.

The Tews Lime and Cement Co., Milwaukee, Wis., has increased its capitalization from $150,000 to $250,000. A. C. Tews is president.

The Baumann Coal Co., Racine, Wis., dealers in all building materials, has increased its capitalization from $25,000 to $75,000.

The Builders Material Co. has been incorporated in Wilson, N. C., with a capital of $250,000, by W. R. Wyatt of Wilson and A. B. Consalve and A. D. Overmyer, of Norfolk, Va.



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1—Bucyrus Model 70-C, Shop No. 1219.

We have a large stock of thoroughly repaired Construction Equipment of all kinds ready for immediate shipment.

Locomotives

8—18-ton, 10x16" Porter Dinkeys, 36" gauge.
2—12-ton, 9x14" Porter Dinkeys, 36" gauge.
1—17x24", 55-ton, 4-6-0, standard gauge.
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AUSTIN GYRATORY CRUSHERS

2—No. 2, Standard Drive
1—No. 3, Standard Drive
1—No. 5, Standard Drive
1—No. 5, Angle Drive
1—No. 6, Standard Drive
1—No. 7½, Standard Drive

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Reading Engineering Co., Inc.
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18—8 & 9 K Crushers

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No. 4 Telsmith Plant, A. C. motor drive.
Air Compressors (steam-belt), 50 to 4000 ft.
40 boilers, 60-150 H.P., 100-130 lbs.
25—60 & 100 H.P. Ver. boilers.
4—NEW No. 4 Gates, Mang. Fit. $1750.00 ea.
100 H.P. Loco. Type Boiler.
25 H.P. Ver. Boiler, buttstrap, Indiana.
Type "O" ⅜-yd. Thew steam shovel.
50, 25, 20, 15 and 125 Kw. Eng. & Turbos.
2—156 Kva., 240 V., 60 Cy., 3 Ph. Eng. Sets.
50 Kw., 125 V., Dir. Cur. Eng. Set, $800.00.
2—72-in. x 18-ft. Buttstrap Boilers.
2—78-in. x 20-ft. Buttstrap Boilers.
2½-yd. & 4½-yd. Bucyrus Dragline Ex.

Send for Our Stock List

Send us your inquiries—Pumps, Steam and Electric Equipment, etc.

ROSS POWER EQUIP. CO.
INDIANAPOLIS, IND.

Machinery For Sale

DRYERS—Direct-heat rotary dryers, 3x25′, 3½ x25′, 4x30′, 5½x50′ 6x50′ and 7x60′; double shell dryers, 4x20′, 5x30′ and 6x35′; steam-heated air rotary dryers, 4x30′ and 6x30′.

KILNS—Rotary kilns, 3½x25′, 5x60′ and 6x70′, 6x100′, 7x80′ and 8x110′.

MILLS—6x8′, 6x5′, 2½x3″ 3x3½′ pebble and ball mills; 8x4′, 6x4′ and 4x4′ continuous ball mills; 3′ March mill; 42″, 33″ and 24″ Fuller-Lehigh mills; 4½x20′, 5x11′, 5x20′, 5½x22′ and 6x20′ tube mills; 7½x13″, 9x15″, 16x10″ and 30x60″ jaw crushers; one "Infant" No. 00, No. 0, No. 2, No. 3, and No. 9 Williams' swing hammer mills; one Kent type "G" mill; 36" and 40" cage mills; 3′ and 4½′ Hardinge mills; 18x12″, 20x12″ and 30x10″ roll crushers; No. 0, No. 1 and No. 3 Sturtevant rotary crushers; one No. 2 Sturtevant ring roll crusher; 3 roll and No. 000, No. 00 and No. 0 Raymond mills; one No. 5 Telsmith breaker; one 36″ Sturtevant emery mill; one 3 roll Griffin mill; 60″ chaser mill.

SPECIALS—Five automatic package weighing machines; jigs; one keystone excavator; 6x8′, 6x5′ and 4x3′ Newaygo vibrating screens, Richardson automatic scales.

Air compressors and tanks.

W. P. Heineken, Engineer
95 Liberty Street, New York. Tel. Cortland 1841

USED EQUIPMENT

Rates for advertising in the Used Equipment Department: $2.50 per column inch per insertion. Minimum charge, $2.50. please send check with your order. These ads must be paid in advance of insertion.

FOR SALE

6 x 60 Rotary Coolers.

5½ x 22 Smidth Tube Mills, complete with iron liners and gears. Good condition.

4 Krupp No. 8 Ball Mills.

No. 66 Smidth Kominuters.

No. 2 Williams Mill.

No. 4 Williams Mill.

8 x 110 Rotary Kilns.

No. 8 Austin Crusher.

1—12" x 18" Ft. Wayne Jaw Crusher.

Steel Buildings.

All of the above equipment in first-class operating condition.

Engineering Sales Company
Independent Life Bldg.
Nashville, Tenn.

FOR SALE

One steel derrick sand plant complete with 85-ft. boom. One 100-H.P. D. D. THOMAS electric hoist. One 12x12 Lidgerwood 3 drum cableway engine. Three mine hoists.

Contractors Equipment Company
1010 Kansas Avenue, Kansas City, Kansas

FOR SALE

2—No. 18 Gates K Gyratory Crushers with elevators and screen; complete; first class; immediate delivery. Also twenty other sizes.

J. F. DONAHOO CO.
Birmingham, Ala.

FOR SALE

Wagon Loader, Jeffrey Type A-5 Gasoline Self Propelling. Practically new and in perfect condition.

2—Robins Belt Conveyors, Complete with idlers, drives and 20" belts. New.

Joseph L. Hiller, 21 S. 12th St., Philadelphia, Pa.

FOR SALE

2—13-ton Standard-gauge Whitcomb Gasoline Locomotives.

1—Class "G" Ingersoll-Rand Air Compressor, 925-ft.

1—Class "H" Ingersoll-Rand Air Compressor, 342-ft.

1—Aerial Tramway System, 1100-ft. centers, with 12 buckets and carriers, 2650 ft. ¾ in. pulling cable, with 1¾ in. and 1¼ in. carrying cable, with sheaves, counterweight equipment, 65 H. P. motor and speed reduction gears complete.

1—Model G Marion Shovel, 2 yd. dipper, standard railroad trucks, excellent condition; price right.

THE CASPARIS STONE CO.
Columbus, Ohio

Locomotives for Rent or Sale

2—50-ton 18x24 in. six-wheel switchers.
1—40-ton 17x24 in. four-wheel switcher.
1—40-ton Vulcan four-driver saddle-tank.
2—18-ton and 14-ton 36-in. gauge Vulcans.
2—10-ton 7x12 in. 36-in. gauge Vulcans.
1—10-ton 36-in. gauge Shay geared.

Miscellaneous

1—Marion 35 steam shovel on traction wheels.
1—Marion 76 steam shovel, No. 3503.
1—Lidgerwood dragline, 60-ft. boom, 2-yd. bucket.
100—60,000-lb. capacity box cars, 40-ft. long.
40—60,000-lb. capacity flat cars, 36-ft. long.
13—6-yd. dump cars, 4-ft. 8½-in. gauge.
12—1½-yd. "V" steel dump cars, 36-in. gauge.
1—Western standard gauge spreader.
2-in., 4-in., and 6-in. simple, duplex, and centrifugal pumps. 10 H.P. and 45 H.P. upright boilers, tripod drills, etc.

LOCOMOTIVE CRANES, RAILWAY EQUIPMENT, etc.

INDUSTRIAL EQUIPMENT CO.
McCormick Building, Chicago, Ill.

New—RAILS—Relaying

All sections on hand for quick shipment. Reasonable prices quoted. Our stock is very complete.

M. K. FRANK
Frick Building Pittsburgh, Pa

FOR SALE

One second hand No. 5 Good Roads Crusher, with opening 11"x26", in excellent condition; a real bargain to a quick buyer. Address

Box 1453 Care of Rock Products

For Sale or Trade

Marion 60 steam shovel, excellent condition, for Marion 36 revolving traction or similar capacity shovel of other make.

Price Stone & Lime Company
Gibson Station, Va.

FOR SALE

100 H.P. Locomotive Fire Box Boiler, 125 lbs.

100 H.P. Vertical Boiler, 100 lbs.

1—No. 8 Good Roads Jaw Crusher on skids, with 40-ft. Jeffrey chain bucket elevator.

1—No. 9 Good Roads Jaw Crusher mounted on wheels, with 14-ft. bucket elevator.

1—36" Symons Disk Crusher.

The Carmichael Gravel Company
Rialto Building, St. Louis, Mo.

FOR SALE

68 ft. Red Canvas Stitched Belt, 26 in. by 8-ply. Never been used. It is in the exact wrapping as delivered from factory.

For service and durability in conveying sand and gravel or crushed stone there is no better belt made. Write or wire immediately.

URBANA GRAVEL CO.
URBANA, TEXAS

FOR SALE

1—2 yd. Williams Special Dredging clam shell bucket, weight 7000 lbs., new, never used.

1—2 yd. Hayward Class G clam shell bucket, in first class condition, very little used.

For prices, write to

The Maule Ojus Rock Company
Ojus, Fla.

FOR SALE

No. 1 Sturtevant Ring Roll Pulverizer.
9"x18" Climax Jaw Crusher.
75 h.p. Erie City Steam Engine.
125 h.p. Atlas Steam Engine.
12"x12" Lidgerwood Standard Cableway Engine.
44" diam. by 26' long Rotary Dryer .
600 lineal feet 1⅛" Roebling wire rope.
100 h.p. 60 cycle, 550 volts, F&M Motor, never used.
100 K.W. 60 cycle, 550 volts, F&M Generator, never used.

Address E. W. Cooper, Engineer
2010 Locke Ave., Nashville, Tenn.

FOR SALE

FULLER MILL, 42" Standard, fan discharge, belt driven type. Practically new, immediate delivery. LOCOMOTIVE, 18 ton, 10x16 Porter 36" gauge saddle tank in good operative condition. Address

Box 1450 Care of Rock Products

CLASSIFIED ADVERTISING

Rates for advertising in the Classified Department: $2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

Help Wanted

Superintendent Wanted

With experience and thoroughly familiar with operations and up-keep of a stone crushing plant, well hole drilling and blasting. Capacity 500 tons per day. Plant is run by electricity. Address

Ky. River Stone & Sand Co.
Lawrenceburg, Ky.

WANTED

Superintendent of sand and gravel quarry in New England, thoroughly familiar with operation and upkeep, two steam shovels, one locomotive, cars, belt conveyors, etc. Plant practically complete. Capacity around 100 yards per hour. Address

Box 1464 **Care Rock Products**

Traveling Salesman Wanted

In Illinois, Missouri and neighboring states for old established lime and building material company. Answers will be held strictly confidential. Address

Box 1465 **Care of Rock Products**

Help Wanted

MANAGER WANTED

Lime Plant, now under construction, with expected daily capacity of 200 tons burned lime through oven type flame kiln, also fluxing stone, wants plant manager who can get maximum results at efficiency costs. Plant conditions will be good and furnished with all required machinery. Local labor scarce. Manager to secure own labor and have full charge of plant. This job will require exceptional managerial ability. Unless you know can make good don't answer. State age, reference, qualifications, experience and salary expected, in first letter. Address reply to

P. O. Box 153, Winchester, Virginia

WANTED

An executive manager for taking charge of a Sand and Gravel Plant in Indiana. A splendid opportunity for a capable man well acquainted with the business. Address

Box 1463 **Care of Rock Products**

Help Wanted

WANTED

Thoroughly competent, reliable, hustling, sober superintendent for manufacturing extra fine stone, brick and cut glass. Substantial reference required.

M. L. T. **Care of Rock Products**

WANTED

Experienced master mechanic for large, up-to-date crusher plant located in Illinois. Good wages. Address

Box 1461 **Care of Rock Products**

Position Wanted

POSITION WANTED

Superintendent desires engagement: crushing plant; 20 years' experience in steam-shovel production; thorough knowledge of details and can produce results; excellent references; salary and tonnage basis only considered. Address

Box 1462 **Care of Rock Products**

Plant for Sale

FOR SALE

A Plant producing Lime, Sand-Lime Brick, and Sand and Gravel. 50 acres in fee simple, with a 100 ft. deep deposit for the best Lime Rock. A first-class opportunity for crushed-rock business. Practically exclusive territory for entire output of plant. Continuous operations. Will sell Sand-Lime Brick machinery separate. Very low price quoted on this Plant. For full particulars, write

G. N. WYCKOFF, Dudley, Kentucky

PRODUCERS—Keep your eyes on the Used Equipment pages of

ROCK PRODUCTS

for your requirements of second hand machinery

Machinery Men—Advertise your equipment here for quick turnover

Wanted—

A young man with some knowledge of the rock products industry or the construction industry to be an Assistant Editor of *Rock Products* — preferably a technical graduate who has demonstrated his ability to write. Address the Editor,

ROCK PRODUCTS
542 South Dearborn Street, Chicago, Illinois

Have you a plant for sale? Do you wish to purchase a plant? Are you in need of a superintendent or manager? Are you looking for a position as plant superintendent or manager? Advertise your wants in these columns for quick results.

We **build complete plants** for producing washed and screened sand and gravel.

We Also Build

Feeders
Pan Conveyors
Bucket Elevators
Screens
Skip Hoists
Car Pullers
Friction Hoists
Coal Crushers
Portable Conveyors

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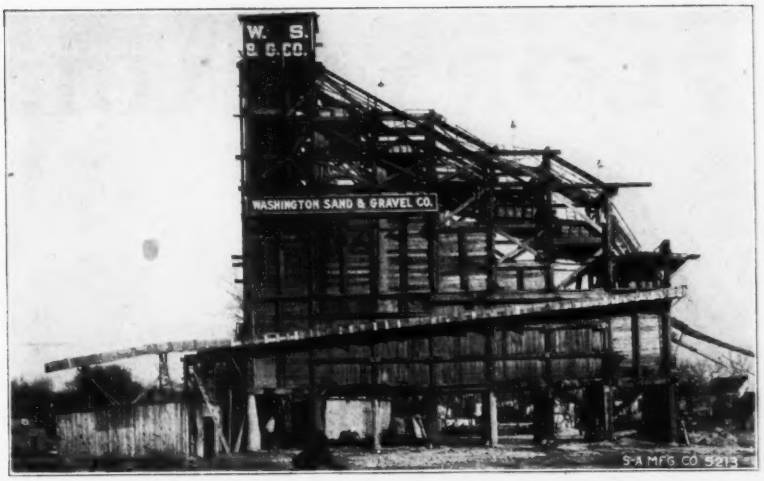


When you contemplate changes or extensions to your present equipment or if you consider building a new plant consult S-A Engineers.

STEPHENS-ADAMSON MFG. CO.

AURORA, ILLINOIS

SCHAFFER
Continuous Lime Hydrators

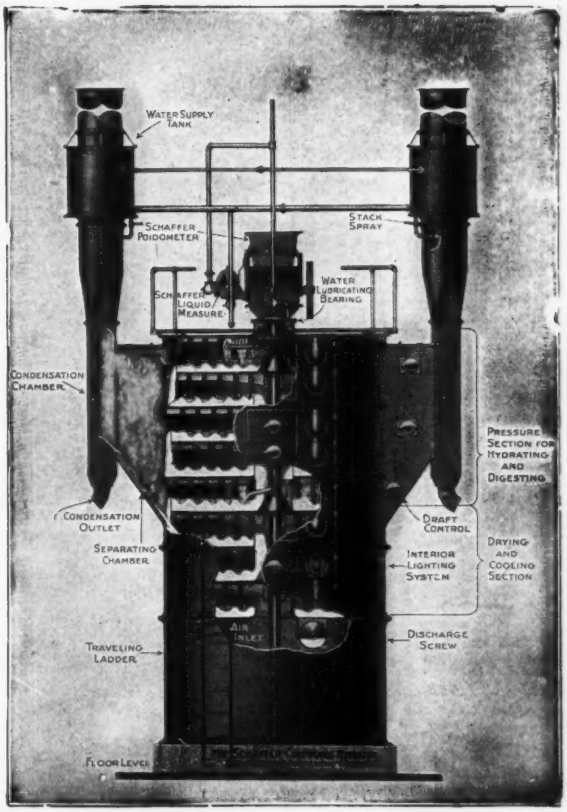
AUTOMATIC operation delivers lime by **weight,** not volume, to the Schaffer Hydrator. Automatically, water, too, is added in correct proportion—insuring a continuous flow of a superior product.

The flexibility of control enables the use of either high calcium or dolomite lime, while at the same time the automatic operation of Schaffer Hydrators solves the labor problem, as they require but little attention.

Our literature on the Schaffer Hydrator covers all the questions you now have in mind. Write for it at once!

Schaffer Engineering & Equipment Co.

Peoples Bank Bldg., PITTSBURGH, PA.



Buyers' Guide of the Rock Products Industry

Classified Directory of Advertisers in Rock Products

Air Compressors
Worthington Pump & Mach. Co.
New York, N. Y.

Bags and Bag Machinery
Bates Valve Bag Co.
Chicago, Ill.
Jaite Co., The
Jaite, Ohio
Miller, Tompkins & Co.
New York City.
Valve Bag Co. of America
Toledo, Ohio.

Belting
Cincinnati Rubber Mfg. Co.
Cincinnati, Ohio.
Hettrick Mfg. Co.
Toledo, Ohio
Main Belting Co.
Philadelphia, Pa.
New York Belting & Packing Co.
New York, N. Y.
U. S. Rubber Co.
New York, N. Y.

Belt Fasteners
Crescent Belt Fastener Co.
New York, N. Y.

Belt Lacing
Crescent Belt Fastener Co.
New York, N. Y.

Belt Rivets
Crescent Belt Fastener Co.
New York, N. Y.

Brick Machines
Wert Mfg. Co.
Chicago, Ill.

Blasting Supplies
Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio.

Buckets, Elevator
Hendrick Mfg. Co.
Carbondale, Pa.
Orton & Steinbrenner
Chicago, Ill.

Buckets
Advance Eng. Co.
Cleveland, O.
Brown Hoisting Mach. Co.
Cleveland, Ohio.
Browning Co.
Cleveland, Ohio.
Marion Steam Shovel Co.
Marion, Ohio.
McMyler Interstate Co.
Cleveland, Ohio.
Owen Bucket Co.
Cleveland, Ohio.

Calcining Machinery
Atlas Car & Mfg. Co.
Cleveland, Ohio.
Butterworth & Lowe
Grand Rapids, Mich.

Chains and Transmitting Machinery
Columbus-McKinnon Chain Co.
Columbus, O.
U. S. Chain & Forging Co.
Pittsburgh, Pa.

Chains, Dredge
U. S. Chain & Forging Co.
Pittsburgh, Pa.

Conveyors and Elevators
Caldwell H. W., & Son Co.
Chicago, Ill.
Gifford-Wood Co.
Hudson, N. Y.
Jeffrey Mfg. Co., The
Columbus, Ohio.
Link Belt Co.
Chicago, Ill.
Robins Conveying Belt Co.
New York, N. Y.
Smith Eng. Works
Milwaukee, Wis.
Stephens-Adamson Mfg. Co.
Aurora, Ill.
Sturtevant Mill Co.
Boston, Mass.
Universal Road Mach. Co.
Kingston, N. Y.

Cranes—Locomotive Gantry
American Crane & Eng. Co.
Toledo, Ohio.
Advance Eng. Co.
Cleveland, O.
Ball Engine Co.
Erie, Pa.
Brown Hoisting Mach. Co.
Cleveland, Ohio.
Browning Co.
Cleveland, Ohio.
Byers Mach. Co., John F.
Ravenna, Ohio.
Chisholm-Moore Mfg. Co.
Cleveland, Ohio.
McMyler-Interstate Co.
Cleveland, Ohio.
Ohio Locomotive Crane Co.
Bucyrus, Ohio.
Orton & Steinbrenner
Chicago, Ill.
Osgood Co., The
Marion, Ohio.

Crushers and Pulverizers
Allis-Chalmers Mfg. Co.
Milwaukee, Wis.
American Pulverizer Co.
St. Louis, Mo.
Austin Mfg. Co.
Chicago, Ill.
Bacon, Earle C., Inc.
New York, N. Y.
Buchanan Co., Inc., C. G.
New York, N. Y.
Bradley Pulverizer Co.
Allentown, Pa.
Butterworth & Lowe
Grand Rapids, Mich.
Chalmers & Williams
Chicago Heights, Ill.
Good Roads Mach. Co.
Philadelphia, Pa.
Gruendler Pat. Crusher & Pulv. Co.
St. Louis, Mo.
Jeffrey Mfg. Co., The
Columbus, Ohio.
K. B. Pulverizer Co.
New York, N. Y.
Kennedy-Van Saun Mfg. & Eng. Corp.
New York, N. Y.
Kent Mill Co.
Brooklyn, N. Y.
Lewistown Fdry. & Mach. Co.
Lewistown, Pa.
McLanahan-Stone Mach. Co.
Hollidaysburg, Pa.
Munson Mill Machinery Co.
Utica, N. Y.
Pennsylvania Crusher Co.
Philadelphia, Pa.
Raymond Bros. Impact Pulverizer Co.
Chicago, Ill.
Smidth & Co., F. L.
New York, N. Y.
Smith Eng. Works
Milwaukee, Wis.
Sturtevant Mill Co.
Boston, Mass.
Stevenson Co.
Wellsville, O.
Traylor Eng. & Mfg. Co.
Allentown, Pa.
Universal Crusher Co.
Cedar Rapids, Iowa.
Universal Road Mach. Co.
Kingston, N. Y.
Webb City & Carterville F. & M. Works
Webb City, Mo.
Williams Pat. Crush. & Pulv. Co.
Chicago, Ill.
Worthington Pump & Mach. Corp
New York, N. Y.

Derricks
Terry Mfg. Co.
New York, N. Y.

Dipper Teeth
American Manganese Steel Co.,
Chicago Heights, Ill.
Taylor-Wharton Iron & Steel Co
High Bridge, N. J.

Dragline Buckets
Brown Hoisting Mach. Co.
Cleveland, Ohio

Drills
American Well Works
Aurora, Ill.
Armstrong Mfg. Co.
Waterloo, Iowa.
Sanderson Cyclone Drill Co.
Orrville, Ohio
Wood Drill Works
Paterson, N. J.

Dryers
American Process Co.
New York City.
Ruggles-Coles Eng. Co.
New York, N. Y.
Vulcan Iron Works
Wilkes-Barre, Pa.

Dynamite
Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio.

Engines, Oil & Gas
Worthington Pump & Mach. Co.
New York, N. Y.

Engines, Steam
Morris Mach. Works
Baldwinsville, N. Y.

Engineers
Arnold & Weigel
Woodville, Ohio
Bacon, Earle C., Inc.
New York, N. Y.
Bradley Pulv. Co.
Allentown, Pa.
Buckbee Co., J. C.
Chicago, Ill.
Fuller Engineering Co.
Allentown, Pa.
James N. Hatch
Chicago, Ill.
R. W. Hunt & Co.
Chicago, Ill.
Massey Co., Geo. B.
Chicago, Ill.
Ross Engineering Co.
Chicago, Ill.
Smidth & Co., F. L.
New York, N. Y.
Schaffer Eng. & Equip. Co.
Pittsburgh, Pa.
Yates, Preston K.
New York, N. Y.

Excavators
Ball Engine Co.
Erie, Pa.
Green, L. P., Chicago, Ill.
Marion Steam Shovel Co.
Marion, Ind.
Owen Bucket Co.
Cleveland, Ohio.

Excavators—Dragline Cableway
Link Belt Co.
Chicago, Ill.

Sauerman Bros.
Chicago, Ill.

Explosives

Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio.

Fuses

Ensign-Bickford Co.
Simsbury, Conn.

Gas Producers

Chapman Eng. Co.
Mt. Vernon, Ohio.
Cooper Co., C. & G.
Mt. Vernon, Ohio
Morgan Construction Co.
Worcester, Mass.

Gears

Caldwell, H. W. & Son Co.
Chicago, Ill.

Generators

Sorgel Electric Co., Milwaukee, Wis.

Glass Sand Equipment

Lewistown Fdy. & Mach. Co.
Lewistown, Pa.

Grinding Mills

Munson Mill Machinery Co.
Utica, N. Y.

Hoists

Chisholm-Moore Mfg. Co.
Cleveland, Ohio
Flory Mfg. Co., S.
New York City.
Thomas Elevator Co.
Chicago, Ill.
Vulcan Iron Works
Wilkes-Barre, Pa.

Hose—Water, Steam, Air Drill, Pneumatic Tool

Cincinnati Rubber Mfg. Co.
Cincinnati, O.
N. Y. Belting & Packing Co.
New York, N. Y.

Hydrating Machinery

Atlas Car & Mfg. Co.
Cleveland, Ohio
Kritzer Co., The
Chicago, Ill.
Miscampbell, H.
Duluth, Minn.
Schaffer Eng. & Equip. Co.
Pittsburgh, Pa.

Hydraulic Dredges

Morris Machine Works
Baldwinsville, N. Y.

Industrial Cars

Atlas Car & Mfg. Co.
Cleveland, Ohio
Easton Car & Constr. Co.
Easton, Pa.
Koppel Indust. Car & Equip. Co.
Koppel, Pa.
Watt Mining Car Wheel Co.
Barnesville, Ohio

Lime Kilns

Arnold & Weigel
Woodville, Ohio
Steacy-Schmidt Mfg. Co.
York, Pa.
Vulcan Iron Works
Wilkes-Barre, Pa.

Loaders and Unloaders

Austin Machinery Corp.
Chicago, Ill.
Ball Engine Co.
Erie, Pa.
Gifford-Wood Co.
Hudson, N. Y.
Jeffrey Mfg. Co., The
Columbus, Ohio

Locomotives

Baldwin Locomotive Works, The
Philadelphia, Pa.
Fate-Root-Heath Co.
Plymouth, Ohio
Jeffrey Mfg. Co., The
Columbus, Ohio
Lima Locomotive Works
New York, N. Y.
Porter Co., H. K.
Pittsburgh, Pa.
Vulcan Iron Works
Wilkes-Barre, Pa.
Whitcomb Co., Geo. D.
Rochelle, Ill.

Motors, Electric

Gifford-Wood Co.
Hudson, N. Y.
Sorgel Electric Co., Milwaukee, Wis.

Motor Trucks

Pierce-Arrow Motor Car Co.
Buffalo, N. Y.
Traylor Eng. & Mfg. Co.
Allentown, Pa.

Packing—Sheet, Piston, Superheat, Hydraulic

Cincinnati Rubber & Mfg. Co.
Cincinnati, Ohio
N. Y. Belting & Packing Co.
New York, N. Y.

Paint and Coatings

Williams, C. K., & Co.
Easton Pa.

Perforated Metals

Chicago Perforating Co.
Chicago, Ill.
Cross Eng. Co.
Carbondale, Pa.
Hendrick Mfg. Co.
Carbondale, Pa.
Nortmann Duffke Co.
Milwaukee, Wis.

Plaster Machinery

Butterworth & Lowe
Grand Rapids, Mich.
Ehrsam & Sons Co., J. B.
Enterprise, Kan.

Portable Conveyors

Stephens-Adamson Mfg. Co.
Aurora, Ill.

Pumps

American Manganese Steel Co.
Chicago Heights, Ill.
American Well Works
Aurora, Ill.
Morris Machine Works
Baldwinsville, N. Y.
Worthington Pump & Mach. Co.
New York, N. Y.

Power Transmitting Machinery

Caldwell H. W., & Son Co.
Chicago, Ill.

Powder

Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio

Pulverized Fuel Equipment

Bradley Pulv. Co.
Allentown, Pa.
Raymond Bros. Impact Pulv. Co.
Chicago, Ill.

Pump Valves

N. Y. Belting & Packing Co.
New York, N. Y.

Quarry Equipment

Marion Steam Shovel Co.
Marion, Ohio
Universal Road Mach. Co.
Kingston, N. Y.

Rails

Hyman-Michaels Co.
Chicago, Ill.

Rope, Wire

American Steel & Wire Co.
Chicago, Ill.
Leschen, A., & Sons Co.
St. Louis, Mo.

Scrapers, Drag

Green, L. P., Chicago, Ill.
Sauerman Bros.
Chicago, Ill.

Screens

Cross Eng. Co.
Carbondale, Pa.
Gifford-Wood Co.
Hudson, N. Y.
Hendrick Mfg. Co.
Carbondale, Pa.
Jeffrey Mfg. Co., The
Columbus, Ohio
Link Belt Co.
Chicago, Ill.
National Engineering Co.
Chicago, Ill.
Ross Eng. Co.
Chicago Ill.
Smith Eng. Works
Milwaukee, Wis.
Stephens-Adamson Mfg. Co.
Aurora, Ill.
Stimpson Equip. Co.
Salt Lake City, Utah
Sturtevant Mill Co.
Boston, Mass.
Tyler Co., The W. S.
Cleveland, Ohio
Universal Road Mach Co.
Kingston, N. Y.

Separators

Rupert M. Gay Co.
New York City.
National Engineering Co.
Chicago, Ill.
Raymond Bros. Impact Pulv. Co.
Chicago, Ill.
Sturtevant Mill Co.
Boston, Mass.
Tyler Co., The W. S.
Cleveland, Ohio

Separators, Magnetic

Buchanan Co., C. G., Inc.
New York, N. Y.

Shovels—Steam and Electric

Ball Engine Co.
Erie, Pa.
Bucyrus Co.
S. Milwaukee, Wis.
Marion Steam Shovel Co.
Marion, Ohio
Osgood Co., The
Marion, Ohio

Shoveling Machines

Myers-Whaley Co.
Knoxville, Tenn.

Speed Reducing Transmission

James, D. O., Mfg. Co.
Chicago, Ill.

Stripping Conveyor

Hamilton Mfg. Co.
Columbus, Ohio.

Testing Sieves and Testing Sieve Shakers

Tyler Co., The W. S.
Cleveland, Ohio

Track Equipment

Central Frog & Switch Co.
Cincinnati, Ohio

Trolleys

Brown Hoisting Mach. Co.
Cleveland, Ohio

Washers, Sand and Gravel

Link Belt Co.
Chicago, Ill.
Smith Eng. Works
Milwaukee, Wis.

Wire Rope

American Steel & Wire Co.
Chicago, Ill.
Leschen, A., & Sons Co.
St. Louis, Mo.

Wire Cloth

Cleveland Wire Cloth Co.
Cleveland, Ohio
Tyler Co. The W. S.
Cleveland, Ohio

Free Service to Readers of

Rock Products

If you are in the market for any kind of machinery, equipment or supplies, or if you desire catalogs, information or prices on any product, simply check off your wishes on the following list and mail to ROCK PRODUCTS. We are at your service—to obtain for you, without expense, catalogs, prices or specific information on every kind of machinery, equipment and supplies—or to help you find the hard to find source of supply. Instead of writing to many concerns or spending time hunting up information, etc., the one request to ROCK PROUCTS brings the complete data you desire.

What can we do for you? Use the following list for convenience. Check what you are in the market for, sign and mail to us.

RESEARCH SERVICE DEPARTMENT

ROCK PRODUCTS, 542 So. Dearborn St., Chicago, Illinois

Please send me catalogs and prices concerning the following items checked below:

..... Air Compressors.
..... Anvils.
..... Bags.
..... Bag Printing Machines.
..... Bagging Machines.
..... Belt Dressings.
..... Belting, Conveying.
..... Belting, Transmission.
..... Bins.
..... Bin Gates.
..... Blast Hole Drills.
..... Blasting Powder.
..... Bodies, Motor Truck.
..... Boilers.
..... Buckets.
..... Buildings, Portable.
..... Cable Coatings.
..... Cableways.
..... Calcining Machinery.
..... Cars.
..... Car Pullers.
..... Car Replacers.
..... Chain Drive.
..... Chain Hoists.
..... Chains, Steel.
..... Clips, Wire Rope.
..... Clutches.
..... Compressors.
..... Conveying Equipment.
..... Conveyors.
..... Cranes.
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..... Screening Plants.
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..... Tracks.
..... Track Material.
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..... Unloaders.
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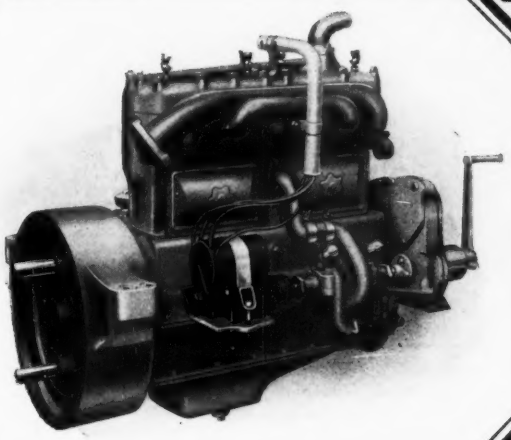

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